Discursive power and Environmental Justice in the new South Africa: The Steel Valley struggle against pollution (1996 – 2006)

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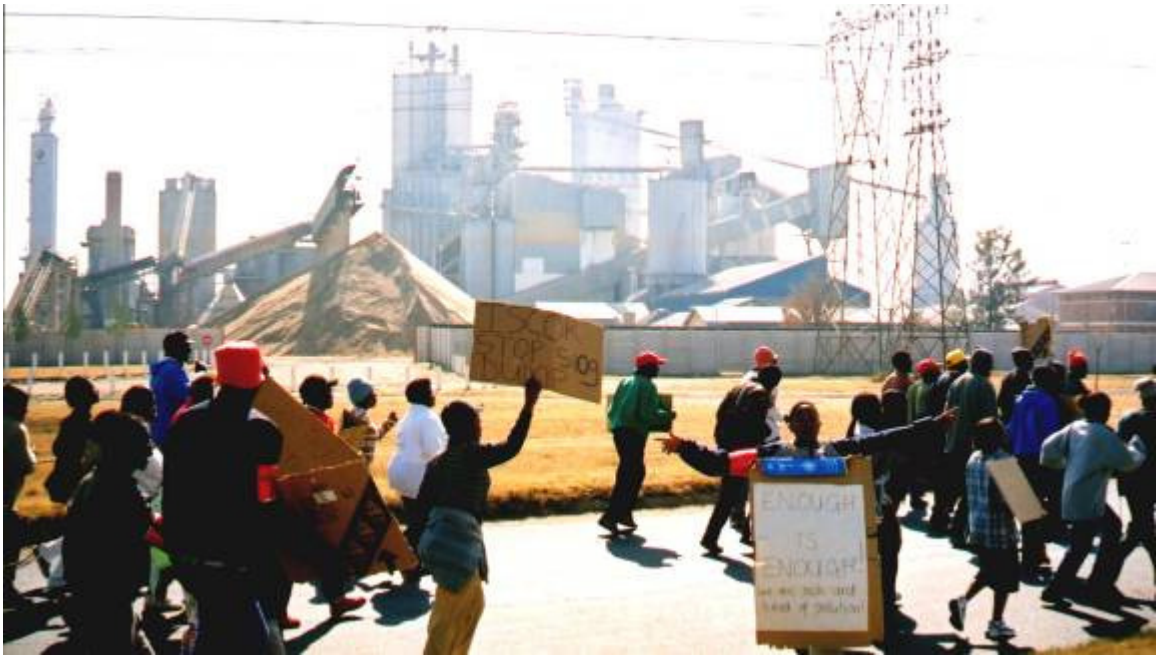
A thesis submitted to the Faculty of Science, University of the Witwatersrand, Johannesburg, in fulfilment of the requirements for the degree of Doctor of Philosophy.

Johannesburg, December 2012



Demonstration against pollution in Steel Valley, Toxic Tour during the World Summit on Sustainable Development, 2002. Picture: Stefan Cramer.

DECLARATION

I declare that this thesis is my own, unaided work. It is being submitted for the Degree of Doctor of Philosophy in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in any other University.

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(Signature of candidate)

7th day of December 2012.

Material from this thesis has appeared in the following publications:

Hallowes, D and Munnik, V, (2006): Poisoned Spaces. Manufacturing Wealth, Producing Poverty. groundWork Report 2006. groundWork, Pietermaritzburg.

Cock, J. and Munnik, V., (2006): Throwing stones at a Giant. An account of the struggle of the Steel Valley community against pollution from the Vanderbijlpark Steel Works. Centre for Civil Society, UKZN Report.

Munnik, V., (2007): Solidarity for Environmental Justice in Southern Africa, GroundWork Special Report.

I gratefully acknowledge the above opportunities to pursue research and exchange ideas with my co-authors during the production of these reports.

A paper and presentation based on the thesis at the Sociology Conference of 11-13 July 2011 at the University of Pretoria: *"Mrs Joey Cock and the Minerals Energy Complex: from personal meaning making to discursive power in a pollution battle"*.

Abstract

The study explores the thesis that discursive power played a major role in the pollution and subsequent destruction of Steel Valley to explain why, despite strenuous efforts by local citizens, the right to live in a healthy environment, guaranteed in the new South African constitution, was not upheld. It analyses the struggle in Steel Valley around the definition of pollution, and decision making about its consequences, in terms of discursive resources and their deployment in discursive arenas, focusing on discursive strategies of the polluted, the polluter and the regulator. This exploration is set within the politics of hegemony in a new South Africa after 1994, as well as the 120 year old Minerals Energy Complex at the centre of the South African political economy. It explains the legitimation of pollution in Steel Valley within the global discourses of environmental management, ecological modernisation and sustainable development prominent since the 1990s.

Discursive power played a major role in the Steel Valley case. Discursive power led to the material outcomes in Steel Valley: the removal of the community, the physical destruction of their buildings and the transformation of the area into a "conservation" buffer zone, along with decisions not to pay residents compensation and not to establish a medical trust. Discursive power was used by the polluter to escape liability, by maintaining scientific and legal uncertainty about the nature, extent and consequences of the pollution. Discursive power enabled the polluter to frame the problem as one of ecological modernisation from which social justice concerns, like compensation, could be excluded. ISCOR's discursive power also overwhelmed the regulator, as the regulator remained too cautious to use to the full the instruments available to it in law, and allowed numerous exemptions. The state and the polluter both pushed issues of Environmental Justice – compensation and rehabilitation – outside the dominant frame of decision making.

The study shows how a superiority of discursive resources on the side of the polluter, derived from a financial and political superiority, translated into decisive defeats for the

Steel Valley community. This superiority derived from a constellation of discursive conditions in scientific, legal and administrative arenas. To describe these conditions, the study constructs a description of a pollution dispositive at work in Steel Valley, which legitimises past and future pollution. It explains the choices of the new government as pollution regulator, by understanding the tax-dependent state as responsive to both legitimacy and accumulation pressures within a hegemonic growth discourse.

A grounded theory approach is followed to study discursive power, synthesizing elements of the social and narrative construction of reality, Critical Discourse Analysis, dispositive analysis and the Environmental Justice approach. It develops a variant of Critical Discourse Analysis that can work across a big case study, by treating discursive power plays as part of a pollution dispositive, which is an assembly of heterogeneous elements (practices and knowledges) that can be understood together as a strategic response to an emerging situation. The pollution dispositive was composed of pre-existing resources available in its environment: local discourses producing disposable others, through racism or a view of dispensable fenceline communities; the legitimations and limitations of the politics of hegemony, and the discourses of growth, limited corporate liability, as well as of environmental management, sustainable development and ecological modernisation.

The study explores the implications of this analysis for Environmental Justice tactics in the areas of environmental management, citizen science, the politics of ecological modernisation, and the politics of hegemony in the new South Africa. It shows that the conditions of fenceline communities and the nature of discursive struggles around them create a tactical terrain which can be used to advance the cause of Environmental Justice. In the tradition of critical theory, it contributes to the understanding of anti-pollution struggles within the Environmental Justice movement, engaging with a triad of concepts that explain the imposition of environmental injustice: externalisation of the costs of pollution, exclusion from decision making and enclosure of resources. This approach can be applied to the environmental struggles of other communities on the fencelines of the Minerals Energy Complex in South Africa.

Dedication

This thesis is dedicated to my wife Peta-Anne and my children Lucas and Thandeka, to the people of Steel Valley and to those who work for Environmental Justice across the world.

This academic work describes the consequences of the pollution of Steel Valley, and its consequent destruction. This is bound to arouse strong feelings. The thesis is not intended to lay blame for these events on specific individuals, because individuals are often constrained not only by the institutional structures within which we work, but also the systems of thought within which we operate.

I wish to thank all who were prepared to speak to me, and express the hope that this work will contribute to a review not only of pollution regulation, but also to a global movement towards Environmental Justice and social justice: putting use values above exchange values in South Africa and elsewhere.

Declaration of involvement

During the time that I prepared this thesis, I worked in and contributed to the broader Environmental Justice movement in South Africa. In the Steel Valley case I was not only a participant observer, but also served as steering committee member of the Vaal Environmental Justice Alliance in its formative first four years (2005 to 2008). I do not claim to be without bias in this research. As a result, the definition of "objectivity" that I work with, in the tradition of critical enquiry, is objectivity in the sense that I aim at providing an accurate description of the tactical terrain of discursive struggles around pollution in the Steel Valley case.

List of Acronyms

ANC	African National Congress
BATNEEC	Best Available Technology Not Entailing Excessive Cost
BF	Blast Furnace
BOF	Basic Oxygen Furnace
CBA	Cost Benefit Analysis
CDA	Critical Discourse Analysis
CBOs	Community Based Organisations
CETP	Central Effluent Treatment Plant
CONNEPP	Consultative National Environmental Policy Process
CRMF	Consolidated Residue Management Facility
CSIR	Council for Scientific and Industrial Research
DG	Director General
DRI	Direct Reduced Iron
DNAPL	Dense Non Aqueous Phase Liquid
DWA	Department of Water Affairs
DWAF	Department of Water Affairs and Forestry
DEAT	Department of Environmental Affairs and Tourism
EAF	Electric Arc furnaces
EIA	Environmental Impact Assessment
EJ	Environmental Justice
EJNF	Environmental Justice Network Forum
FOSV	Friends of Steel Valley
GDACE	Gauteng Department of Agriculture, Conservation and Environment
GEAR	Growth Equity And Redistribution
NGOs	Non-Governmental Organisations
IDC	Industrial Development Corporation
IEM	Integrated Environmental Management
IVS	ISCOR Vanderbijl Steel
LNAPL	Light Non Aqueous Phase Liquid
MAWU	Metal and Allied Workers Union

MEC	Minerals Energy Complex
MERG	Macro-Economic Research Group
MSF	Medicins Sans Frontieres
NEMA	National Environmental Management Act
NUMSA	National Union of Mineworkers of South Africa
OPEC	Organisation of Petroleum Exporting Countries
PAHs	Polycyclic Aromatic Hydrocarbons
PCDD/F	Polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans
RDP	Reconstruction and Development Programme
SA	South Africa
SAQMC	Sasolburg Air Quality Monitoring Committee
SDCEA	South Durban Community Environmental Alliance
TB	Tuberculosis
TDS	Total Dissolved Solids
TETP	Terminal Effluent Treatment Plant
UKZN	University of Kwazulu Natal
UN	United Nations
UNCED	United Nations Conference on Environment and Development
US	United States (of America)
VDB	Vanderbijlpark
VEJA	Vaal Environmental Justice Alliance
VOCs	Volatile Organic Compounds
WISA	Water Institute of South Africa
WGSC	Western Gauteng Services Council
WSSD	World Summit on Sustainable Development

Note on terminology:

In this thesis the expression "Steel Valley" or "Greater Steel Valley" refers to all the smallholding settlements that were colloquially known by that name, even though strictly speaking they carried separate names: Lamontville, Drakeville, Steel Valley, Rosashof, etc.

The steelmaker is referred to by three names, namely ISCOR (before the take-over by Mittal); ISCOR/Mittal after the takeover, and where the context is not clear, or as Mittal after the steel factory is firmly part of the multinational. Where there are specific reasons to be precise and of course in quoted texts, other names appear, including Ispat International (an early name for Mittal) and ArcelorMittal (after Mittal Steel merged with Arcelor Steel).

The expressions "state" and "regulator" are used interchangeably, to refer to the institutions dealing with water quality and broader issues as a state. The expression "government" is reserved for, in this case, the apartheid government or the ANC government respectively where these party political orientations to state power are the main focus of attention.

The South African Department of Water Affairs (DWA) has, at various times, carried responsibility for Forestry, or been relieved of that responsibility. This text uses the acronyms DWA and DWAF (Department of Water Affairs and Forestry) interchangeably, according to historical usage at the time.

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Chapter 1: Environmental Justice, discursive power and pollution in transition

Introduction: Discursive power and the disappearance of Steel Valley

In 1994 South Africa made its globally acclaimed transition to a constitutional democracy. Two years later the country declared its commitment to Environmental Justice in section 24 of its new constitution (1996):

> "Everyone has the right (a) to an environment that is not harmful to their health or well-being, and (b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that… prevent pollution and ecological degradation…"

Inspired by these political changes, a community in the Vaal Triangle, South Africa's industrial heartland, decided to challenge the pollution (see detailed discussion in chapter 5) that they had experienced from their steel factory neighbour for more than 40 years. Their subsequent struggle illustrates the processes a fenceline community – a community living on the fencelines of a polluting industry and thus exposed to pollution – can go through when they confront their powerful neighbours.

Greater Steel Valley, a community living on around 600 smallholdings to the West of the Vanderbijlpark Steel Works of ISCOR, had been established roughly at the same time as the steel factory itself, in the early 1950s. The steel factory was an important part of a government initiative to establish industry on the Vaal coalfields, which, in the late 1950s, also became the home of the world's biggest coal-to-liquids fuel producer, SASOL (Hallowes and Munnik, 2006). Downstream industries were also established. State records show an official awareness of pollution impacts since the early 1960s, corroborated by long term residents (DWAF, 1961; Jaap van Rensburg interview, 2005).

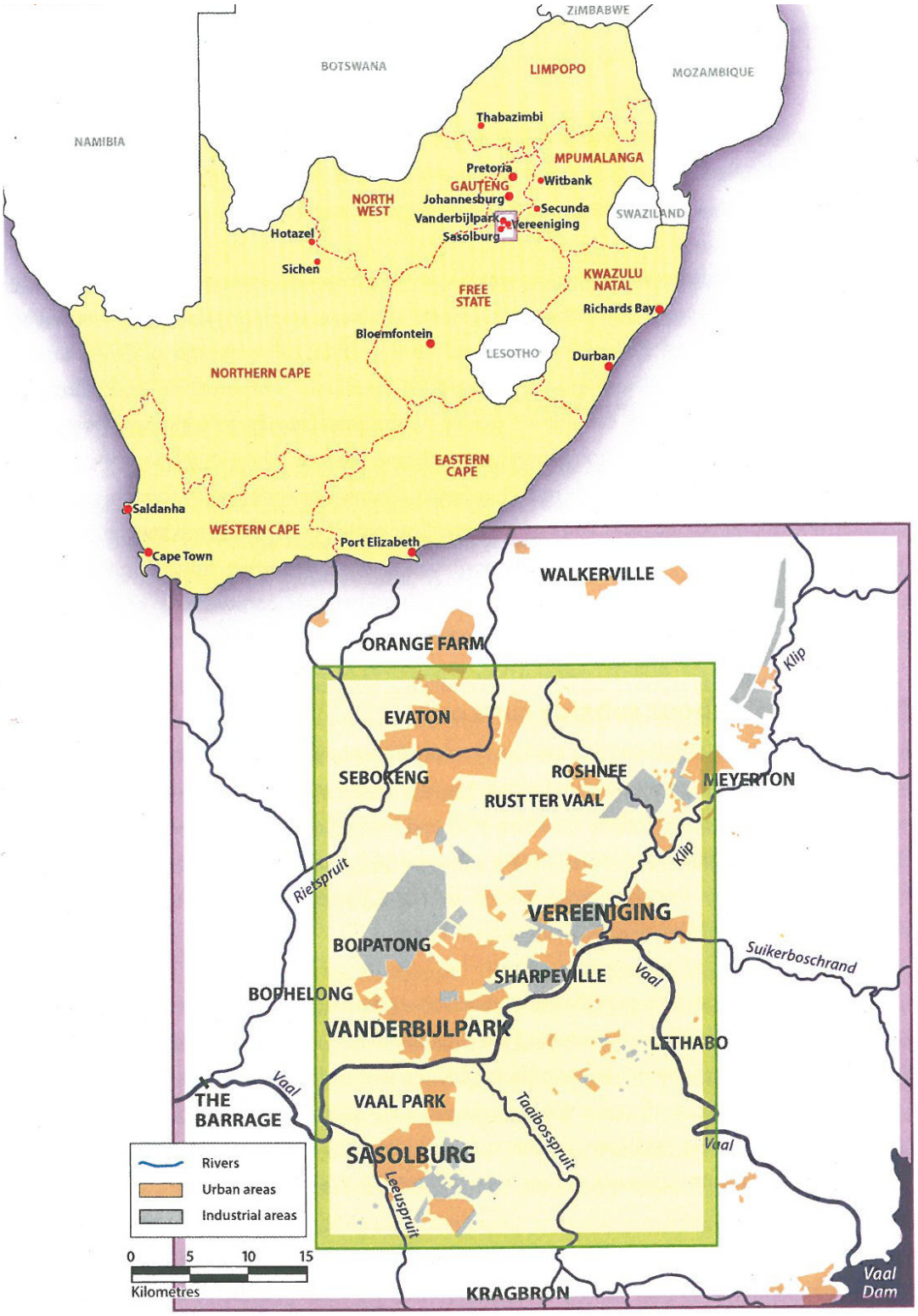

Fig 1.1 Orientation map to the Vaal Triangle. Map with permission of groundWork.

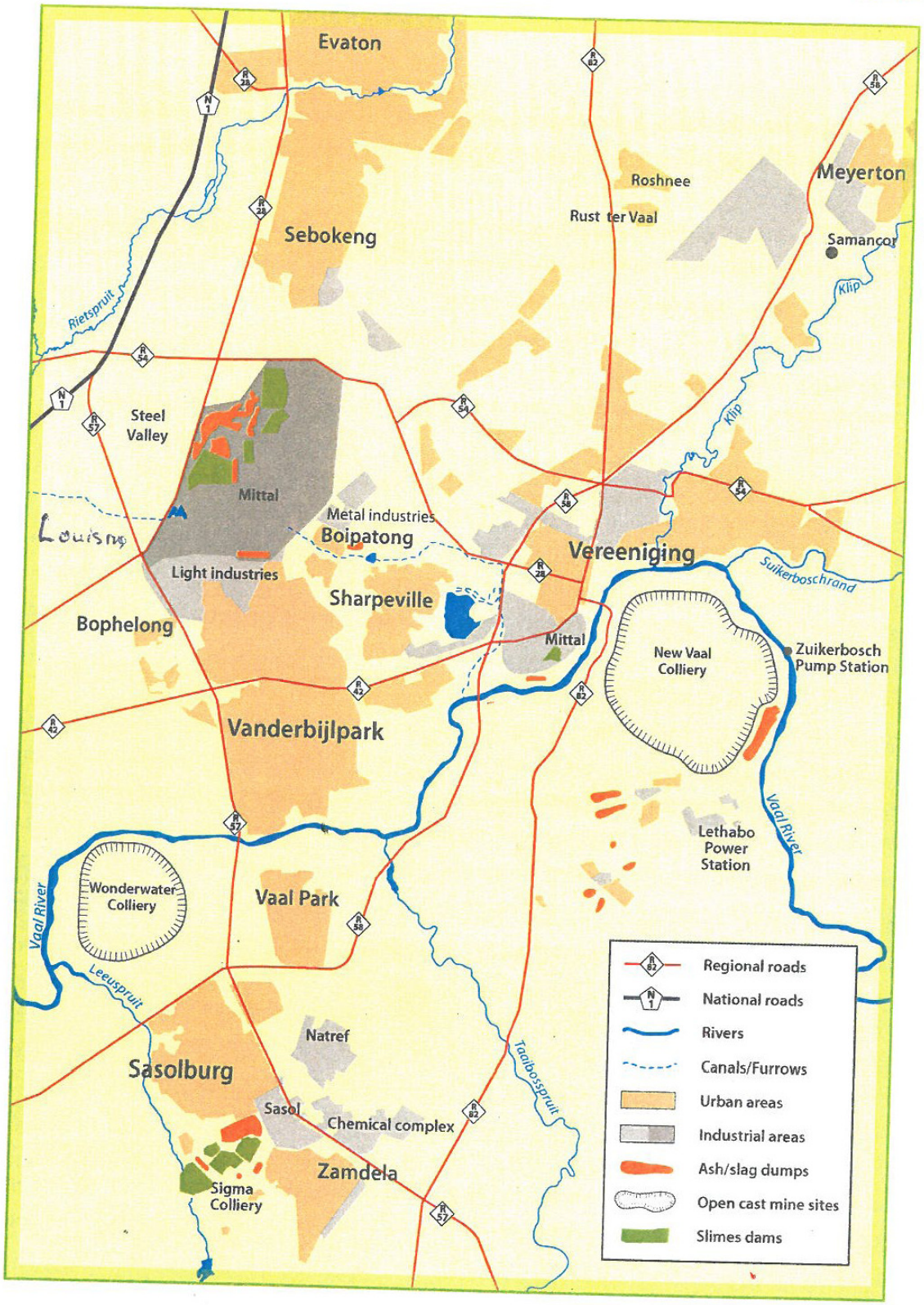

Figure 1.2 Steel Valley in relation to the Mittal Steel factory in overview. Map with permission from groundWork.

For most of its existence, Steel Valley was a racially segmented society, with white smallholders as owners, retaining one or two black families as farmworkers or servants on each holding. This started changing by 1990, when black South Africans could buy land in "white areas", and established themselves as smallholders in the area.

A large number of Steel Valley residents worked in the steel factory, in addition to carrying on small-scale stock farming and cropping activities. Steel Valley residents had access to local businesses, schools, churches and other social amenities (Cock and Munnik, 2006). Their first serious challenge to the pollution coincided with the election of a local governmentin 1995 for this and adjacent areas, in which a number of residents played prominent roles. The details of this struggle are taken up in later chapters.

The Steel Valley residents used several discursive instruments available in the new South Africa to defend themselves against the pollution: the newly established post-apartheid non-racial local government, a series of environmental forums, litigation in civil courts, a constitutional court challenge, water use license hearings, extensive media coverage and public protests.

But their efforts failed to stop the pollution, or get them compensation for the health burdens, and economic losses imposed on them by the past pollution (see chapters 5 to 9). Instead, their contestation precipitated the disintegration and physical destruction of Steel Valley. By 2002, their entire community of nearly 600 smallholdings, their houses, outbuildings and shops had disappeared. Their small farms had been bought up by the steelmaker. The area had been cordoned off with electric fences. Their houses and outbuildings had been flattened to the ground with bulldozers (see Fig 1.3.). Most of the population had been dispersed into neighbouring towns and townships.

Fig 1.3: Rubble of a Steel Valley house. Picture: Stefan Cramer, Friends of Steel Valley.

As the exotic trees and plants used in agriculture disappeared, the natural Highveld grassland grew back (Fig 1.4). It took on the appearance of a conservation area as the steel maker introduced a new population of antelope, ostriches and cattle (Fig 1.5). The area was renamed "Ferroland" – land of iron - by its new owner, the global steel producer, Mittal, who in this period took control of the apartheid parastatal ISCOR.

This dramatic transformation illustrates the material force of discursive power. It also made the pollution invisible. Were it not for the ex-residents' testimony and continued activism – and the three or four houses still stubbornly clinging to the landscape – the

innocent passer-by could easily conclude that the Steel Valley pollution problem, and Steel Valley itself, had never existed.

However, Steel Valley lives on as a discursive construct through folk memory and activism. Dispersed from Steel Valley, some of the ex-residents continued their battle, refusing to accept that the victors write the history. A "toxic tour" of overseas dignitaries, in which the steel factory was a "highlight", as well as public protests during the World

Fig 1.4 Steel Valley from the air: only foundations remaining, vegetation growing back. Picture by Bathini Mbatha.

Summit on Sustainable Development (WSSD) in 2002 brought their history to the attention of the world. Ex-residents continued to take part in consultation processes made available under environmental legislation in the new South Africa. They formed a

regional (Vaal Triangle) alliance with other fenceline and polluted communities. They achieved the integration of Steel Valley survivors into first a national Environmental Justice movement and then a global network of communities affected by Mittal's pollution, which works to hold Mittal accountable for its pollution worldwide (Aitken 2008; 2009; and see chapter 9). In so doing, they moved from resistance to pollution, to a refusal of closure on that history, in which that history becomes an activist resource. This refusal to accept defeat, and instead using the energy provoked by their treatment to respond, illustrates a different, emancipatory, side of discursive power which is a crucial aspect of Environmental Justice in our time.

Fig 1.5 Ferroland as conservation area. Picture: Bathini Mbatha

Their experiences left Steel Valley residents with two puzzling and upsetting questions. One was "how could anybody deny that there was pollution, and get away with it?" The

other was why their attempts to appeal to the environmental rights so clearly promised in the South African constitution, had failed? Both questions point to the play of discursive power. In fact, the events described in the Steel Valley pollution case study are intensely discursive. They consist of:

- a forum in which an extensive archive of information about the pollution covering almost fifty years comes to light, which then forms the basis of a court case for compensation;
- another forum in which the attitudes of Steel Valley residents towards a buy-out are tested;
- an 8000 page document (the Master Plan, developed by consultants for the steel company) which describes the pollution that is claimed not to exist, and how to remedy it, and then becomes a site of contestation about access to this information, in which the state plays a crucial role;
- scientists signing confidentiality agreements that stop them from sharing information about pollution;
- a whistle blower providing information from the inside, including a 2003 summary of the Master Plan;
- a court case settled out of court so that no legal finding is made on the liability of the polluter;
- the telling of family stories of loss of health and fortune, repeated over and over, to each other and later to the media, in the process polishing them into persuasive narratives;
- a vision of a resettlement of a whole community, including its workers and labour tenants;
- a "toxic tour" by members of the European parliament who visit a steel factory during the World Summit on Sustainable Development, itself a dense discursive event;
- a cost-benefit analysis on the buy-out vs. remediation of Steel Valley;
- an international exchange of information and planning together on tactics;
- a Day of Remembrance to defend the last four families remaining in Steel Valley;
- media exchanges from the perspectives of all the participants;

- parliamentary questions and explanations;
- water use licences, non-compliance notices, and notes between officials of the Department of Water Affairs;
- and the reframing of this pollution struggle as part of an international Environmental Justice struggle.

It is these plays of discursive power, and the relationship between discursive and material power, that come into focus in this study.

Constructing an explanation through the study of discursive power

The immediate thesis that the study explores is that discursive power played a major role in the pollution and subsequent destruction of Steel Valley. Starting from the observation that discursive contests, strategies and tactics, and the imbalances of discursive resources seem to constitute the bulk of the contestation in the pollution struggle in Steel Valley, it attempts to explain, by analysing the use of discursive power by the protagonists, the apparently unreasonable outcomes of the pollution struggle:

1. why was it so difficult for residents to prove the existence of the pollution, and
2. why did the expected consequences of the environmental right – protection against pollution, compensation for damages and ill health – not materialise?

However, the Steel Valley experience was not a simple one of defeat. It also challenged currently dominant power structures, through social mobilization which in turn relies on the active reframing of current "realities" (Pena, 2005). This process can be "provoked" by the experiences of communities on the fencelines of pollution, when their experiences make the official promises of environmental protection appear hollow. The study thus primarily explores the experiences of a fenceline community, and how these experiences contributed to the growth of Environmental Justice consciousness and approach among Steel Valley residents.

The second intention of this study is to contribute to the understanding of anti-pollution struggles within the Environmental Justice (EJ) movement. It aims to not only enrich EJ understandings of discursive power, but through the description of the discursive terrain of struggle in one specific pollution struggle, to develop tactical knowledge that could be useful to the South African and possibly the global EJ movement. This intention fits into the critical tradition of Habermas and the Frankfurt school which holds that "social theory should be oriented towards critiquing and changing society, in contrast to traditional theory oriented solely to understanding and explaining it" (Wodak and Meyer, 2009: 6). Specifically, "critical theories… want to produce and convey critical knowledge that enables human beings to emancipate themselves from forms of domination through self-reflection. Thus, they are aimed at producing 'enlightenment and emancipation'" (2009: 7).

In order to do this, this study constructs a "chain of explanation" (see Robbins, 2004: 72), moving from the immediate experiences in Steel Valley struggles to a progressively larger contextualisation of these events within the continuities and discontinuities (Foucault, 1991) of

- the South African post-apartheid transition,
- the dominant Minerals Energy Complex and
- the global transition to sustainable development and environmental management.

The case study spans the transition from apartheid to democratic South Africa (starting in 1994, the year of SA first democratic election). This provides an opportunity to explore the effects on South African pollution discourse of a radical, society wide, change in rules of using discursive power, summarised as a new politics of hegemony, following on the coercive, surplus power of apartheid (Greenstein, 2003; Marais, 2001). In this transition, public opinion became important, while rights to access to information, free speech and free association were guaranteed in the constitution and codified into law. The media became much freer as the apartheid state receded. However, these changes happened against the background of tensions between neoliberal, social democratic and socialist discourses in political debate (Duncan, 2000). In this case study, the tax-dependent state

is described as a responsive actor, responding to both legitimacy and accumulation pressures (Jessop, 1990; Offe, 1984; Yudelman, 1984). This is a third important focus area.

The study locates the 1994 democratic transition within the history of the very durable 120 year old Minerals Energy Complex (MEC) (Fine 2009; Fine and Rustomjee, 1994). The MEC played a crucial role in the structuring of the Southern African region and, at the start of the previous century (1889 – 1910) played a pivotal role in the formation of the South African state (Turton *et al* 2006; Lester *et al*, 2000; Ashforth, 1990). The Minerals Energy Complex itself followed on earlier phases of colonial exploitation, including slavery and ivory hunting in the sixteenth century (Hodges, 2004; MacKenzie 1987). This thesis thus makes a contribution to the emerging description of the South African political economy in terms of the MEC (Fine 2009; Freund, 2009; Eustace-Brown *et al*, 2006; Fine and Rustomjee, 1996). Its contribution is to draw attention to the political ecology (Robbins, 2004) of the MEC and its fenceline communities, visible in an increasing number of pollution struggles on the fencelines of the mines and industries that constitute the MEC. This is a fourth area of focus.

The South African political transition takes place simultaneously with a worldwide transition to sustainable development, environmental management and ecological modernisation, described by Mol and Spaargaren (2000) as a new sphere of decision making about economy and society. These discourses are important determinants of discursive struggles around pollution, since they have created and reorganised powerful discursive resources in the forms of knowledges, practices, institutions, strategies and hegemonies. A description of these discourses – with associated supports like the limited liability of companies and the constraints of the modern, tax-dependent state as environmental impact regulator - completes the chain of explanation of the "apparently unreasonable" outcomes of the pollution struggle in Steel Valley.

The study also makes a contribution to the theory and methodology of research into pollution struggles. The field of political ecology brings together a range of

methodologies, united by an interest in providing political rather than apolitical explanations (thus dealing with issues of power), and a strong interest in how "nature" is socially constructed (Robbins, 2004). As is common in political ecology, the fieldwork for this study was done as participant observation. The implications of this approach – and the author's close association with activists in Steel Valley – are discussed in chapter 3, on methodology.

The key methodological concept in this study is "discursive power". In order to study discursive power, this case study synthesizes elements of the social and narrative construction of reality (Bijker, 1995; Hannigan, 1995, Riessman, 1993; Goffman, 1969; Berger and Luckmann, 1966), Critical Discourse Analysis (Fairclough, 2009; 1995; 1992; 1989), dispositive analysis and the Environmental Justice approach. Its methodological contribution is to develop an approach based on Critical Discourse Analysis (CDA) that can work across a big case study, by treating discursive power plays as part of a pollution dispositive: a strategic response to an emerging situation (Jaeger, 2001; Foucault, 1982). Dispositive analysis relates discursive to material power, and enables an explanation of the multiple ways in which discursive action leads to a transformation of the landscape.

What is discursive power?

What is discursive power? Following Foucault, (1982) and Fairclough, (1995; 1989), I define discursive power for the purposes of this study as *the ongoing construction and deployment of meaning, which enables and constrains social actors to describe and define a situation, its objects, the rules of speaking about them and developing ways of acting upon them*. What follows below will be revisited in more detail in the theoretical chapter 2.

Meaning is constructed in many settings, and at many scales, from the personal life world, to a national and increasingly a planetary imagination (Sachs, 1999; Anderson,

1991; Berger and Luckmann, 1966). The construction of meaning results in the creation of discursive resources. However, discursive power is not possessed, but created in its immediate use, or deployment (Foucault, 1982). The deployment of meaning as persuasive or authoritative knowledge in contests about the existence of pollution, its consequences and what should be done about it, including issues of liability, is enabled and constrained by the rules of "discursive arenas". In the Steel Valley case, discursive contests and encounters took place in different arenas in which different sets of rules apply. The rules of a court, for example, are very legal and formal, to a large degree opaque to outsiders to the legal profession. Therefore, participation in the legal arena is impossible without mediation from the legal profession. In the scientific arena, the ability to deploy information with scientific authority is determined by prehistories of scientific practice, areas of research, and the authority of the person making the intervention to speak as a scientist (Kuhn, 1970).

A discursive strategy includes the creation or accessing of discursive resources and their deployment in rule-bound arenas in order to achieve power, i.e. a desired outcome which is different from that of the opponent (Etzioni, 1993; Olsen, 1993; 1970; Mann, 1986). The discursive strategies identified in this study include:

1. community meaning making through personal narratives (and its persuasive use in public opinion), used to defend the interests of the polluted,
2. the use of the power of scientific experts to authoritatively define pollution,
3. deployment of the authority of the state in its efforts to balance legitimation and accumulation imperatives,
4. the polluter's strategy to escape liability,
5. using the hegemony of the growth and development discourse as a shield for pollution,
6. using ecological modernisation to achieve legitimacy and control information, and
7. turning to Environmental Justice as a fundamental reframing of questions of power, science and economics.

Discursive power exists in a close relationship with material power. It both enables and reflects material power (Fairclough, 1995; 1989). The exercise of discursive power also requires material power, for example printing presses and broadcasting equipment that enable public opinion (Herman and Chomsky, 1994). The work of Michel Foucault and his followers allows us to describe a pollution complex that contains both discursive and material power in terms of a "pollution dispositive". Foucault understands by a dispositive:

> "… a sort of – shall we say – formation which has as its major function at a given historical moment that of responding to an urgent need (urgence). The (dispositive) thus has a dominant strategic function". It is "… a thoroughly heterogeneous ensemble consisting of discourses, institutions, architectural forms, regulatory decisions, laws, administrative measures, scientific statements, philosophical, moral and philanthropic propositions – in short, the said as much as the unsaid. The (dispositive) itself is the system of relations that can be established between these elements" (Foucault, 1980b: 194).

Siegfried Jaeger, a critical discourse analyst who developed Foucault's work to deal more explicitly with non-discursive elements of power, describes dispositives as strategies that respond to challenges – usually for an elite or aspiring elite – in the political economy (Jaeger, 2001). This dispositive or complex is heterogeneous since it brings together discursive practices, non-discursive practices and "material manifestations", (2001: 56). He argues that knowledge "flows into" raw material to give it shapes that suit those whose strategy it serves (2001: 60) – for example the "conservation landscape" that replaced the Steel Valley community. The concept of the dispositive reflects an underlying idea that human activity shapes society as well as material reality – in a process of ongoing change as well as domination, and struggles for domination.

In this study, the concept of pollution dispositives is developed: *pollution dispositives actively transform landscapes, shape institutions and create and deploy knowledges in order to legitimate the continued externalization of pollution costs.* It is precisely these

practices of legitimation of pollution that has drawn the interest of Environmental Justice (EJ) activists, researchers and the fenceline communities affected by it.

The Environmental Justice interest in discursive practices

Discursive power is an important theme for EJ activists and analysts. EJ practice has many discursive aspects, for example activist involvement in popular epidemiology and the politics of expertise. Social mobilisation itself is strongly discursive. Discursive power is a crucial ingredient of solidarity power (Elworthy, 1996). *Solidarity power is a social and collective power that emerges when less powerful actors, typically fenceline communities and activists under attack, generate power through solidarity and working together.* This type of power is well expressed in the World Social Forum double slogan of "solidarity-in-diversity" and "diversity-in-solidarity" (Munnik and Wilson, 2003). This process of generating collective power discursively involves deconstructing various powerful discourses and learning how to use or fight them. A number of EJ writers have made this explicit. Novotny (2000, quoted in Agyeman, 2005: 27), explains:

> "framing is, in a very real sense, part of the repertoire of mobilization strategies that are available to a movement, so that the movement filters the problems it is confronting through the history, the beliefs, the language and cultural experiences that are seen by its leaders as most likely to engender widespread sympathy and involvement".

Sometimes this conscious use of discursive power is expressed as an immediate activist "operational" necessity, both internally, for solidarity, and in making sense of the context, the need for the opposition, as in Glazer and Glazer (1998: 105):

> "Like other environmental groups, the wheat farmers had to articulate a belief system that supported their opposition to the (toxic waste) landfill."

EJ intellectuals emphasise the discursive side of their struggle. Pellow and Brulle (2005:12) for example, argue that:

> "changes in social structures are brought about through a redefinition of what constitutes the common sense embodied in the everyday practices of society… We view this as the central battlefield for the EJ movement – the struggle over the definition of environmental and social reality between social movement groups and the corporate-state structures that produce environmental inequalities".

Environmental Justice theorist Devon Pena, specifically defines "discursive politics" as referring to "contested encounters between political actors articulating variant ideologies in struggles over "legitimation" of divergent worldviews. (2005:150, footnote 2). Pena offers the following description of EJ discursive practice:

> "Environmental Justice discourses challenged environmental thinkers to reconsider the meaning of basic concepts like nature, environment, ecosystem, wilderness and biodiversity; they forced many to consider the role of race, ethnicity, national origin, class, gender, and culture in the framing of environmental history, environmental ethics, and ecological politics… EJ discourses recentered the problematic of ecological politics in the constellation of cultural differences that construct variant epistemologies of nature…" (2005: 131).

Pena quotes the example of how the discursive act of defining a piece of land as "wilderness" participates in an act of economic alienation. The "brutal enclosure" of the land described as wilderness denies the locals access to their means of livelihood, while the land becomes the economic basis for "eco-tourism" (Pena, 2005). In the Steel Valley case, a polluted landscape, now no longer populated, is now presented as a conservation area.

Academic writing on Environmental Justice is also often couched in "discursive" terms. This statement from Julie Sze in *The Environmental Justice Reader: Politics Poetics and Pedagogy* (2002: 163) is representative:

> "Environmental Justice is a political movement concerned with public policy issues of environmental racism, as well as a cultural movement interested in issues of ideology and representation."

And according to Castells, (1997: 362) "… most successful campaigns (of the Environmental Justice movements), their most striking initiatives, often result from 'turbulences' in the interactive network of multi-layered communication…"

Environmental Justice activists and academics thus generally have an explicit interest in the framing of issues and discursive politics.

Discursive politics, which include the concept of "knowledge politics", are crucially important in a risk society. According to Beck (1992), the risks of living in an industrial society, such as radioactive contamination, toxic waste, the release of untested chemicals into the environment, are mostly invisible and sometimes incomprehensible outside of expert knowledge. Moreover, these risks are unequally distributed. Therefore, argues Beck, the distribution of risk becomes the central politics in risk societies. As a result, a type of discursive politics develops that either denies or minimizes the extent and nature of environmental degradation. How these risks are managed and communicated is crucial to legitimacy and legitimation. The EJ movement continuously confronts, in a risk society, not only the uneven distribution of risk, but also its continuous creation.

Environmental Justice

Historically, the Steel Valley struggle was taken up by, and drawn into, a national and then international struggle for Environmental Justice. The Environmental Justice movement bases itself on a fundamental critique of the current growth model (Pena and Brulle, 2005, Bakan, 2004; Kovel, 2002; Henderson, 1996; Schnaiberg, 1980). This critique focuses on the externalisation of the costs of pollution, exclusion from decision making and the enclosure of resources. In the process, it takes up questions of the politics

of knowledge in discursive contests between the industrialists, scientists, citizens and regulators.

Although the environmental right in section 24 of the new South African constitution can be broadly called an Environmental Justice right, Environmental Justice in this thesis is a specific framework for understanding struggles against pollution, born out of the experience of *fenceline communities: communities who live on the fences of polluting industries.* Environmental Justice (EJ) first appeared as a critique of environmental racism in the United States, when "communities of color" discovered that they were targeted to be victims of pollution. From the beginning this tradition combined resistance to pollution through community activism, with reflection on the causes of the pollution. Pellow and Brulle, editors of a collection of essays reflecting on EJ tactics (2005), declare that:

> "The EJ movement has sought to redefine environmentalism as much more integrated with the social needs of human populations, and, in contrast with the more eco-centric environmental movement, its fundamental goals include challenging the capitalist growth economy as well" (2005:3).

In the tradition of the foundational analysis of Allan Schnaiberg (1980), they describe the capitalist economy as a "treadmill of production" that:

> "…continues to create ecological problems through a self-reinforcing mechanism of ever more production and consumption. The logic of the treadmill of production is an ever-growing need for capital investment in order to generate goods for sale on the market. From the environment, it requires growing inputs of energy and material… In practice the state has often acted to accelerate the treadmill in the hope of avoiding political conflict… The ecological result of this process is that the use of natural resources continues to increase, regardless of the consequences on the sustainability of the ecosystem. The social result is that inequalities increase and working-class populations receive less and less material benefit for their labour. Thus, both ecological

> disorganisation and race and class inequalities are inherent by-products of the social order" (Pellow and Brulle, 2005: 4).

They also incorporate Beck's description of risk positions in an advanced industrial society: "like wealth, risk adheres to the class pattern, only inversely; wealth accumulates at the top, risks at the bottom" (1986:35 quoted in 2005:5). Where the poor are also racially defined, this creates the pattern of environmental racism.

Subsequent writers in second and third world contexts have developed the notion of a "double risk society". In Beck's original description of a risk society, based on experiences and analyses in industrialised Europe (West Germany), the question of how to distribute the "goods" produced in industrial society has been superseded by the question of how the "bads" or risks, of which pollution is the main example, should be distributed. But according to Leonardas Rinkevicius, writing about Lithuania:

> "…the current state of development in many countries of the world…is characterized by the mixed importance of both issues: the distribution of goods as well as the distribution of "bads". Because of the acuteness of both types of issues social anxiety in many developing and transitional countries… is more complex than in industrialized societies which have already reached a certain level of material welfare. Because of the complex social anxiety over the distribution of goods and 'bads', developing countries and the ones in transition might be termed *'double-risk' societies* as compared with affluent societies which have supposedly already passed the phase of 'simple' modernity" (2000: 164).

This applies to South Africa where industrial production and mining exist side by side with extreme poverty, for example the Vaal Triangle, of which Steel Valley forms part.

Environmental Justice in South Africa

The EJ framework was enthusiastically adopted by SA activists in the early 1990s, at the time of and as part of the opening up of politics in the public sphere. In 1992, an Environmental Justice Network Forum (EJNF) was founded. At the Earthlife Africa conference where the EJNF was established, US inner city activist Dana Alston introduced it as a very broad approach which extends existing social justice or human rights work into the environmental sphere.

For these South Africans, seeing Environmental Justice as an extension of anti-apartheid struggle was as natural as it was for black communities and activists in the US to proceed from the basis of the civil rights struggle. The Environmental Justice movement similarly grew in South Africa as an alternative to the narrowly focused and elite conservation movement, not as an outgrowth of it. EJ activists positioned themselves in opposition to many forms of conservation as they supported black South Africans in their efforts to claim back land that they had lost to conservation (Koch and Cock, 1991). Apartheid presented clear forms of environmental injustice – control over movement, resettlement on the worst land, second class services, if any – and the almost automatic location of waste dumps near black communities mirrored the US experience (Ramphele, 1991; Koch and Cock, 1991). The analysis of environmental racism found resonance in South Africa. In South African industrial areas, many black communities have been purposely or at least negligently placed in the path of pollution as a result of strict racial town planning, particularly in the Vaal Triangle (Cock and Munnik, 2006; Hallowes and Munnik, 2006). Often, it was a case of using the cheapest land having the highest risk of pollution for black housing, for example situating Soweto in between the mines, and the planning of Vanderbijlpark.

The EJNF brought together more than 550 organisations, ranging from Community Based Organisations (CBOs) to non-governmental organisations (NGOs) to churches to

trade unions. The EJNF took up grassroots issues: the mercury poisoning of workers and communities in Pietermaritzburg, the toxic legacy of asbestos mining, illness as a result of working with vanadium, a dam that split a community in two, the absence of basic services, and waste dumps next to townships (Hallowes, Nyandu and Watkins, not dated). The EJNF also did high profile policy work, playing a leading role in the National Environmental Policy Process (CONNEPP) which formulated South Africa's progressive National Environmental Management Act, a framework law that laid down the principles for further legislation, and also formulated section 24 of the new constitution, the "Environmental Justice right". The right was formulated in such a way that the health of communities was the reason that the environment had to be protected, not the other way round as in earlier environmental (or, more properly, conservation) movements (Department of Environmental Affairs and Tourism, 1996).

The actualisation of the environmental right in the South African constitution has been far more difficult than writing it. The adoption of the neoliberal GEAR policy in 1996 confirmed earlier signals from the ANC that it would favour economic growth (McKinley, 1997).

An after-effect of South Africa's dramatic and well-publicised liberation struggle was a series of high profile conferences, amongst them the World Conference Against Racism, in 2001, and the World Summit on Sustainable Development (WSSD) in 2002. While the new South African government moved to a conservative, neo-liberal, growth-based approach, which saw a tension between growth and environment (conveniently focusing on this divide inherited from conservative, middle class white conservationists), the Environmental Justice movement focused on communities on the fenceline of industry and exposed to its pollution.

Mechanisms of environmental injustice

In 2002, a series of groundWork Reports started as annual analyses which were intended to serve as alternatives to the government-published state of the environment reports. groundWork is an NGO that developed out of the EJNF and specialises in supporting communities on the fencelines of pollution in dealing with the externalities of pollution (Hallowes and Munnik, 2006; 2007; Butler and Hallowes, 2002). The reports developed descriptions of specific mechanisms that relate environmental injustice to the project of accumulation. These concepts focus the analysis on class issues, and the nature and operation of capitalist production.

Exclusion from decision making is a crucial mechanism for producing environmental injustice. In South Africa, apartheid gave whites a say in the political system, while black South Africans were excluded. The result was a system that produced and policed cheap black labour for mining interests, so long as they paid white workers higher wages (Von Holdt, 2003; O'Meara, 1996; Yudelman, 1984). Exclusion from decision making can take a sophisticated form. In South Africa, companies like ISCOR may release their plans in piecemeal fashion, withhold some information from the public, or provide more information than activists can deal with. Some activists see Environmental Impact Assessments (EIAs) and water license applications as processes that often do not make a difference to the actual outcome, but do tie up activists' time (Muna Lakhani, personal communication, 2002). Information can be kept secret, thus excluding communities from knowing how polluted they are, and denying communities the evidence to take legal steps for protection.

The *enclosure of resources* – colonisation, taking over land, water, wildlife – makes it impossible to escape the dominant system. People are then forced to find work within the dominant system, for example on the terms of the big mining companies, because no

other resources are available from which to make a living. ISCOR's prominence in the South Africa industrial economy is an example of enclosure – and even more forcefully, its dominant position locally in Vanderbijlpark, where it is estimated to be responsible for two thirds of local GDP, and a formidably strong player in local politics (Prinsloo, 1994).

The *imposition of externalities* refers to passing on the costs of production to other parties, mostly in the form of pollution. Sasolburg and Boipatong, neighbours of heavy industries in the Vaal Triangle and fenceline communities like Steel Valley, are at risk from pollution every day. Other examples of ongoing pollution sources are mine tailings, the huge coal fired power station ash heaps, acid mine drainage from "abandoned" coal mines and "closed" gold mines, that have been left behind for the government to clean up with public money, or for communities to just live with forever as a permanent tax on their health (see Chapter 10). Together these three are powerful mechanisms producing environmental injustice and impoverishing people. These mechanisms, and in particular the exclusion of victims of pollution from decision making through discursive means, are the focus of analysis in this study.

The politics of hegemony in the new South Africa

The Steel Valley case study is framed by two crucial transitions in South Africa since the 1990s: the transition to a politics of hegemony under the new ANC government (Greenstein, 2003) and a simultaneous transition to a sustainable development paradigm. Both have important discursive components (Greenstein, 2003; Marais 2001, Hajer and Fischer, 1999; Sachs, 1999; Harvey, 1996; O'Riordan, 1995).

Hegemony is a much discussed concept (see Bottomore et al, 1988). The discussion here is based on the understanding it carries in Critical Discourse Analysis, which emphasises that discursive power is crucial to hegemony, which in turn relates to maintaining a workable consensus within society, oriented and maintained by a ruling elite (Fairclough, 1992). Fairclough postulates that "the character of power in modern societies is tied to

problems of managing populations" (Fairclough, 1992: 50). This formulation points to the long standing consideration in discursive theory of "hegemony", and in particular the contribution made by Antonio Gramsci. Gramsci's crucial contribution was his, at the time, novel conception that the power of dominant groups is not only concentrated in the state, but also "entrenched" in civil society, where great bulwarks of protection of state and class power are raised through various means of legitimation, such as the conservative tendency in the Christian churches' exhortations to obey the state, or forms of art, and patronage of art, which confirm the excellence of the elite, for example (Buci-Glucksmann, 1980; Gramsci, 1971; 1957).

Fairclough describes Gramsci's understanding of hegemony as "a mode of domination which is based upon alliances, the incorporation of subordinate groups, and the generation of consent". He argues that "hegemonies within particular organizations and institutions and at a societal level are produced, reproduced, contested and transformed in discourse" (Fairclough, 1992: 9):

> "Hegemony is leadership as much as domination across the economic, political, cultural and ideological domains of a society. Hegemony is the power over society as a whole of one of the fundamental economically-defined classes in alliance with other social forces, but is never achieved more than partially and temporarily, as an 'unstable equilibrium'. Hegemony is about constructing alliances, and integrating rather than simply dominating subordinate classes, through concessions or through ideological means, to win their consent. Hegemony is a focus of constant struggle around points of greatest instability between classes and blocs, to construct or sustain or fracture alliances and relations of domination/subordination, which takes economic, political and ideological forms. Hegemonic struggle takes place on a broad front, which includes the institutions of civil society (education, trade unions, family) with possible unevenness between different levels and domains" (1992: 92).

The achievement of hegemony relies, as Fairclough argued above, on a combination of material concessions and ideological work. Hegemonic struggle – attacking the legitimacy of the apartheid system in order to disable it - was a major component of the

ANC liberation movement's strategy to defeat the apartheid state. The strategy achieved both internal governability in South Africa, as well as international isolation and economic sanctions. It was the loss of legitimacy that, in the late 1980s, made accumulation impossible or difficult (Gelb, 1991). Marais (2001: 37) described the situation:

> "… severe contradictions were engendered within an accumulation strategy that depended on cheap, expendable African labour, but also rested on an import substitution (and capital-intensive) industrialization strategy which required an ever-expanding market for its products. Simultaneously, the expulsion of the vast majority of the population from the enclave of (even comparative) privilege generated a variety of social and political responses which ranged from low productivity to forms of resistance that threatened the legitimacy and authority of the capitalist state".

So, when the ANC government came to power in 1994, a major task facing it was to re-establish or refresh the legitimacy of the state. In the formulation of Macro-Economic Research Group (MERG):

> "the political transformation of South Africa will make it possible to achieve economic growth (and to set realistic goals for improved living standards and economic security for all South Africans, especially the most disadvantaged)" (1993, 1).

The challenge was – and remains – to achieve hegemony both through material means, which depend on the performance of the national economy (and material concessions from the state), and ideological means, which depend on a continuity with the discursive politics of the liberation struggle.

The new government set in motion a complex process to relegitimise the state. It articulated a series of promises, in the 1994 ANC election manifesto, the Reconstruction and Development Programme (RDP), and most clearly in the 1996 Constitution, to guarantee basic rights of process, and access to basic services to minimum standards. Consequently, the South African transition to a post-apartheid democracy also meant a

transition to a politics of hegemony, in which public opinion became free and important, and open discussion and organisation were allowed (further pursued in chapter 7). A side effect was that information about the activities of corporates became much more available.

The new government guaranteed freedom of the press and publicly introduced an emphasis on government accountability to the people. The public sphere was transformed and revitalized through a process of forums, policy formulation and robust public discussions characteristic of a new politics of hegemony after 1994 (Greenstein, 2003). The South African bill of rights is an important outcome of this historic process, and includes section 24, the environmental right, which reads:

> "Everyone has the right (a) to an environment that is not harmful to their health or well-being, and (b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that… prevent pollution and ecological degradation…"

The environmental right in the constitution was interpreted by the Steel Valley residents as an opportunity to fight for their right to a healthy environment under the new, legitimate ANC led state (see chapter 6). This study will argue that their expectations reflected an uncritical acceptance of the rhetoric of the new politics of hegemony, and that they, like other fenceline communities, discovered through their struggles that the modern state's legitimation strategies are closely coupled to, and constrained by, the protection of accumulation in the economy (discussed in chapter 10). The case study thus explores whether, in the arena of pollution, the practices of the new South African state equalled its constitutional promises.

State legitimacy depends on a range of factors. Fundamentally, a democratic government must persuade its people, for example through regular elections, and explanations of its actions, that it is acting in the national interest, and "serving the interests of all". Such consent is generated both on a discursive and a material level: the actual provision of

services like infrastructure, health and education, protection against crime and pollution (Offe, 1984). The need for material provision translates into the need for government to keep the formal economy going (accumulation) because it depends on it for its revenues, essentially tax, that it uses to legitimate itself through material provision. When the material provision is judged by the population, discursive power plays a big role, for example in gathering knowledge (e.g. statistics of delivery), establishing which expectations are legitimate and which not, and also what is possible. Many of these functions fall within the spheres of the policy process, public opinion and formal politics.

The concept of "legitimation" is central to the analysis of the Steel Valley history. Thompson's description of legitimation is: "Relations of domination may be established and sustained, as Max Weber observed, by being represented as legitimate, that is, as just and worthy of support" (Thompson, 1990: 61). Strategies to achieve this include rationalization, "a chain of reasoning which seeks to justify a set of social relations or institutions, and thereby to persuade an audience that it is worthy of support", and universalization, by means of which "institutional arrangements that serve the interests of some individuals are represented as serving the interests of all" (Thompson, 1990: 61). The "national interest" is a common version of universalization.

In a politics of hegemony, as the concept is used in this study, there is a give and take that opens up space for knowledge flows, public discussion and democratic influence. In this situation, there are opportunities for resisting and disciplining pollution. This case study explores these opportunities or "space" for resistance and transformation in the area of pollution in one specific pollution history.

Transition to sustainable development and ecological modernisation

It is precisely in the area of pollution that a second profound transition frames the Steel Valley case study: the worldwide transition to "ecological rationality", a new sphere of decision making about economy and society (Mol and Spaargaren, 2000). The first awareness of a general environmental crisis emerged in the 1960s (Dryzek and

Schlossberg, 2005). In the 1970s and 1980s, environmental movements emerged in Europe that were marked both by a search for alternative, mostly small or "human scale" alternative societal forms, and an "antagonistic relationship with the state and with industry… challenging the existing order or political paradigm of that time" (Spaargaren, 2000: 44).

Spaargaren argues that beginning in the 1980s, both the state and industry responded to the pressures from environmental movements, by implementing changes to production including the internalisation of external costs. They were guided by the belief that "the dynamics of capitalism can (be made to) work in the direction of sustainable production and consumption" (Spaargaren, 2000: 48). Alliances emerged between policy makers, industrialists, consumers and some big environmental organisations. International discussions, exemplified in the Brundtland report of 1987, led to the "Earth Summit" in 1992 which resulted in the Agenda for the 21st century or Agenda 21 (UN, 1991). For Spaargaren (2000: 53):

> "the main conclusion here can and must be that environmental issues moved from the periphery to the centre of concern for a great number of different social groups and organisations. This can be interpreted as a process of gradual institutionalisation of environmental concerns both within the media and its public, within different levels of the governmental administration and within business circles."

This institutionalisation means that ecological concerns developed into "an autonomous, independent factor which has to be taken into account and be dealt with in the restructuring of production and consumption" (2005: 53). In short, ecological modernisation is seen as the response of the state and industry to the demands of environmental movements – which could be accomplished within the confines of existing institutions. In other words, it accepted some aspects of the environmental critique, but refused the idea that society needed to be fundamentally restructured in order to become ecological.

The trio of ecological modernisation, environmental management and sustainable development can all be understood as aspects of this same movement of "ecological rationality". Environmental management is generally seen as "a good thing", as it manages previous uncontrolled pollution. It has become hegemonic or "normal", as Harvey argues, in the form of:

> "a powerful and persuasive array of discourses … embedded (sometimes even without knowing it) within this standard view (of environmental management) and its associated practices, institutions, beliefs and powers. Environmental economics, environmental engineering, environmental law, planning and policy analysis, as a wide range of scientific endeavours, are ranged broadly in support of it. (1999: 163).

Two discursive tactics lie at the core of this trio of discourses and practices. The one is that environmental management by the institutions that created the crisis in the first place, is needed to manage the environmental crisis (Harvey, 1999). This is discussed below as an aspect of the sustainable development discourse. The other prominent tactic is that nature is appropriated by these institutions by redefining it as a collection of "natural resources", as an infrastructure or renewable warehouse for economic exploitation:

> "…nature's energies, materials and sites are redefined by the eco-knowledges of resource managerialism as manageable resources for human beings to realize great material 'goods' for sizeable numbers of some people, even though greater material and immaterial 'bads' also might be inflicted upon even larger numbers of other people, who do not reside in or benefit from the advanced national economies that basically monopolize the use of world resources at a comparative handful of highly developed regional and municipal sites" (Luke, 1999: 109).

Environmental management discursively creates objects out of nature that can be managed as part of the formal economy. A prime site for this discursive work is institutions like universities which "produce eco-managerialists, or professional technical workers with the specific knowledge – as it has been scientifically validated – to cope with 'the environmental crisis' on what are believed to be sound scientific and technical

grounds" (Luke, 1999: 109) within what is increasingly a constrictive framework based on current hegemonic (neoliberal) economic thinking. A crucial example is the description of nature as "natural resources". A critic of environmental management, Luke argues that:

> "the environment, if one follows Foucault's lines of reasoning, must not be understood either as the naturally given sphere of all ecological processes that human power keeps under control or as a mysterious domain of obscure terrestrial events which human knowledge works to explain. Instead, it emerges as a very historical artefact of expert management that is largely constructed by techno-scientific interventions, because it cannot remain an occluded reality that is difficult to comprehend for a modern economy. In this network of interventions, the simulation of spaces, the intensification of resources, the incitement of discoveries, the formation of special knowledges, the strengthening of controls and the provocation of resistances all can be linked to one another…" (Luke, 1999: 108).

Thus, environmental management is able to subsume natural resources as well as ecological challenges into a field of which the disciplines of environmental management can take command, and exclude demands for environmental and social justice in the process (Hajer and Fischer, 1999).

The legitimacy of sustainable development

Sustainable development is the more explicitly value-based and political discourse legitimating environmental management practices. Environmental management can be traced back to "extensive public health measures in nineteenth-century urban settings and following through to present day efforts to improve air and water quality in many areas of the advanced capitalist world" (Harvey, 1999: 164), as the industrial age impacted negatively upon air and water to such an extent that it threatened the capitalist system itself. In turn, the consolidation of sustainable development can be traced to the 1992 Earth Summit, which "facilitated a new way of seeing and apprehending the world"

which in turn "created the basis for the new political strategy of sustainable development" (Hajer and Fischer 1999: 1). In the discourse of sustainable development, environmental problems were framed in terms of a major ecological crisis, while, at the same time, a solution was implied: environmental management. The manageable problems included "the need to reduce carbon dioxide emissions, the limited sustainable pathways to development in the South, the need to fight poverty and deforestation, as well as the need to develop new strategies for water resources management and the protection of biodiversity" (Hajer and Fischer, 1991:1). Agenda 21 codified this agreement into 40 chapters as the basis for global action.

Harvey argues that the discourse of sustainable development enabled an elite to recycle old solutions. For example, the World Bank used the new discourse to "decentralize the process of development to see if indigenous methods led by indigenous peoples, with women cast in a much more central role, could work so as to pay off the accumulating debts built up precisely through World Bank-imposed western-style development", or to design new competitive strategies by profiting from "superior environmental technologies and stricter global regulation" (Harvey, 1999: 170). Industry profited from opportunities in clean-up technology, waste management and innovation. Climate change concerns were captured to create a new market for finance capital in carbon credits (Hallowes and Munnik, 2008; Lohmann, 2006). Harvey argues that sustainable development is framed in a way that reconfirms the roles and values of the very institutions that have caused the ecological crisis. It is a remarkable discursive achievement to absorb the critique that used to be contained in sustainable development. This achievement is made possible by a heterogeneity of institutions involved in the creation, circulation and deployment of meaning. But this framing does not go unchallenged, in particular by the equally global movement of Environmental Justice (Pena and Brulle, 2005; Hajer and Fischer, 1999; Sachs, 1999.).

South Africa was not officially present at the Earth Summit of 1992, where the grand design of environmental management and sustainable development was moulded and accepted by heads of state in the ground-breaking Agenda 21 (Hajer and Fischer, 1999;

UN, 1993; Cooper 1992). But the pressure of the new discourse around sustainability and its alarm at pollution did reach the apartheid government which took notice of pollution issues in the 1991 "Report of the Three Committees of the President's Council on A National Environmental Management System" (President's Council, 1991). It coincided with a time of increasing public awareness and concern in public opinion internationally as well as in South Africa. A number of books drew attention to the issues in South Africa in the same year, among them Koch and Cock (1991), Ramphele (1991) and Clarke (1991). They all sketched pictures of the environmental impact, neglect and degradation that characterised apartheid (these developments are taken up again in chapter 7).

Overview of following chapters

The case study presented in this thesis follows a grounded theory approach (Babbie and Mouton, 2001). This means that the analysis first engaged with explaining the two central questions in the study: debates and decisions about the existence and the consequences of pollution. Theory was then sought to build explanations (Yin, 1989). During the seven years of study, this process happened in many iterative loops. However, it is presented in this thesis as a linear process, arranged for ease of understanding.

Chapter 2 develops the theoretical foundation for a methodological approach that can deal with the needs of this case study in the tradition of grounded theory. The concept of discursive power is theoretically anchored in the work of Fairclough (1995; 1989) Foucault (1982; 1973), Dryzek (1997), Habermas (1984), Thompson (1990) and other theorists. The chapter shows how pollution is socially constructed. The processes of meaning making, the embedding of assumptions in discourse, and the framing of discourse, have been studied extensively by Critical Discourse Analysis. The chapter introduces the broad spectrum covered by discursive analysis, and argues that the use of language and symbols is not only a reflection of power, but a constitutive element of creating and deploying power. The knowledge resources to construct pollution authoritatively have been built up over a long time, such as the disciplines of chemistry

and medicine. Discursive resources are created in meaning making processes and disciplines, and then deployed in previously constructed arenas that make up the framework of decision making in a modern society: law (the courts), government, public opinion, and the media. Each of the arenas has different rules for the use of discursive power, including importantly who has authority to speak and be taken seriously. Taken together, these arenas constitute a terrain of contestation about the existence and consequences of pollution. The focus then moves to how discursive power not only shapes our view of the world, but is profoundly involved in shaping the material world through a myriad of decision making and planning processes. Discursive power and material power are intertwined. Material power is a prerequisite for creating and accessing discursive resources, particularly in arenas with high barriers to entry, such as scientific and legal arenas where only expert and usually expensive authority is accepted. One discourse that is central to the pollution dispositive and its legitimation of pollution is taken as illustration: that of natural science as exemplified in chemistry. It describes a politics of expertise that is crucial to the creation of differential abilities between the polluter, the polluted and the regulator, to access and use discursive power. It is also science – in its present day application of environmental management - that discursively holds together the pollution dispositive. The most basic discursive resource in the Steel Valley struggle was the ability to describe the pollution as real, to point out the origin of the pollution, as well as the effects or impacts of the pollution. Determining how the pollution was constructed, and understood, crucially influenced the outcomes in various discursive encounters in the public, legal, and regulation areas. This chapter looks in depth at the authority of science, in the form of chemistry. It also looks at medical science, which, in contrast, illustrates how limited the knowledge of toxicology can sometimes be. The chapter explains why constructing convincing evidence of pollution impacts is challenging. Attention is also given to the powerful role that scientific certainty and uncertainty plays in shielding polluters from consequences. Finally, the concept of a dispositive is useful to analyse how discursive power "flows" into reality and shapes it.

Chapter 3, on methodology, introduces background about how this case study was constructed, what sources of evidence and information were used, and places it within the existing literature on Vaal Triangle and its pollution, which has a strong historical slant. The case study approach as outlined by Robert Yin (1989) is taken as a point of departure. This is followed by an explanation of how the case study was created, and the methods used in its creation. Then the various sources of information are discussed, and the varying ease and difficulty of accessing these. The content of the case study – a series of 31 discursive encounters of which a limited number will be analysed in detail – is presented in overview, the discursive arenas in which they took place and the strategies of which they are seen to be part. The appendix provides a means for the reader to keep track of a fifteen year history of sometimes confusing encounters. The chapter also defines the meaning of a number of crucial terms such as discursive resources, arenas and contests. The most important of these encounters will be analysed (in chapters 7 to 9) in terms of discursive resources, arenas and strategies while focusing on the two central questions about the pollution and its consequences. Chapter 3 also introduces the "body of evidence" on which the thesis basis its analysis, and points to the variety of voices and sources of evidence, as well as the methodology in creating this study. It emphasizes and explains some characteristics of this body of evidence: that it is overwhelming in scope, that it is partly hidden, but that great parts came into public view due to the contestation, and that it is in fact contested, with serious consequences for the winners and losers of these contestations. This struggle was analysed using archival material, participant observation and interviews. Issues around participant observation and "objectivity" are discussed in this chapter. As a result of discursive struggles, the materials in the case study entered the public domain and a central interest is to show how these discursive struggles take place in the arena of public opinion. The chapter ends with a discussion of how a dispositive can be described, focusing on Foucault's classic work, *Discipline and Punish* (1982), and Ashforth's analysis of the creation of a dispositive of knowledge and practice of migrant labour around "The Native Question", a central dynamic in the political economy of South Africa and its MEC (1990).

Chapter 4 describes the building blocks of the pollution dispositive that were created in the history of the Minerals Energy Complex, both in the material world and in terms of knowledges. It situates Steel Valley in the context of the Vaal Triangle and its 120 year history as part of the Minerals Energy Complex of MEC. It focuses broadly on the transformation of the Vaal Triangle through the MEC, describing the formation of a South African industrial heartland through the development of the Vereeniging coalfields and the Vaal River water supply. Thus, a physical-spatial history, and a political history emerge. The material reality of the current Vaal Triangle is intense pollution. In terms of discursive elements this chapter describes both colonialism and apartheid as dominated by surplus power which operates in a constricted discursive space in which opposition invites very direct coercion. This coercion provoked the creation of political discursive resources which is illustrated in this section, and in other chapters described as the basis for an Environmental Justice movement in South Africa. The chapter also introduces the history of ISCOR, and points to the material power embodied in apartheid and in racial Fordism, and its use of surplus power or coercion. The pre-existing struggles against apartheid predisposed Vaal residents and activists to take on the EJ framework as it developed in SA, in a process analogous to EJ developing out of the movement for civil rights in the US.

Chapter 5 describes the steel factory at Vanderbijlpark specifically as a source of pollution, and the Steel Valley settlement as the fenceline community receiving the pollution. This chapter explains how steel making pollutes by tracing the different processes involved. It explores the roots of the relationship between ISCOR and the regulator, the Department of Water Affairs as well as evidence from an archive of consultants' and government officials' reports which repeatedly brought signs and evidence of pollution to the attention of the operators of the steel works, and also the regulator. The archive shows that a huge amount of information on ISCOR's potential and actual pollution was in circulation, albeit only in small, privileged circles whose members worked with ISCOR in allowing the pollution, until these documents became public as a result of the pollution forums and subsequent court cases described in later chapters. They also show a pattern of lax regulation, exceedances and breaking of permit

conditions, known and ongoing pollution. The question of what pollution the steel mill would likely have imposed on its neighbour, Steel Valley, is considered. The chapter places the above information in the context of an overview history of South African water quality regulation before 1994, and closes this historical section with a consideration of the roots of environmental management emerging around 1990 in South Africa.

The next four chapters – **chapters 6, 7, 8 and 9** - engage with the creation and deployment of discursive resources in the struggle about pollution in Steel Valley. Two crucial questions were contested: the existence and sources of the pollution, and what the social, legal and economic consequences of the pollution should rightfully be. The focus is on the discursive resources, discursive strategies and their deployment in discursive arenas by the three central actors in the case study: the community, the state and the polluter. In chapter 10, these descriptions are drawn together to describe a tactical terrain for pollution struggles, which is then used to venture a view of the pollution dispositive at work in Steel Valley, with a discussion of its conditions of possibility.

In **chapter 6**, two aspects of discursive power are brought into focus: the creation of discursive resources through processes of "community meaning making", and how the community used these resources, and other resources that they could access, in their quest for Environmental Justice. It explores a number of examples of how Steel Valley residents made meaning of their experiences, and how they used the discursive power that they created for themselves. Community members developed strong perspectives on the existence of the pollution. Taken together**,** their descriptions made up an account of the cost of the externalities imposed on them by the pollution. Descriptions include damage to the landscape of Steel Valley, the effects on people's bodies, on their farms, crops and livestock, and therefore their livelihoods, as well as the losses they suffered in terms of community life and amenities. All these elements can be seen in the narratives that were collected during fieldwork in Steel Valley. Residents were also proactive. They created a vision of an alternative, which also contained all the elements that needed to be replaced to allow the community as a whole to re-establish itself elsewhere. While these narratives are persuasive, especially in the media, they also lack scientific rigour and can

be embellished by folkloric and other dramatic elements. The chapter also describes how residents reached out to acquire expert and political assistance in their struggle, ultimately appealing to the state and the legal system to guarantee their right to a healthy environment.

The aim of **chapter 7** is to explore how the state used its discursive power, and explain why. It explores the state's sources of discursive power, what this enabled the state to do, but also how the state was constrained in its discursive power. The state was called upon by both polluter and polluted to play a role in their discursive strategies. The chapter examines three crucial sets of events that show how the state responded to this expectation. First, the focus is on a process starting in 1994, in which the regulator showed a strong interest in disciplining ISCOR for its pollution, and how this process was transformed into a drive for ecological modernisation via regulation. It touches on the process around the still secret Master Plan (at time of writing in October 2012, personal communication Samson Mokoena, but see discussion in chapter 3) showing how ISCOR enrolled the regulator and its opponents in an elaborate performance of "environmental management". The chapter describes the power of the state to create an arena for discussion, information gathering and sharing, and decision making, in the shape of the DWAF forum. It traces the fortunes of the forum, its outcomes and aftermath which most notably included the buy-out of the area. The focus here is on the Main Report of the Cost Benefit Analysis (L&W Environmental, 1998), showing how the decision about the future of Steel Valley was framed through the deployment of expertise. It then examines the response of the state to accusations of failure to deal with the Steel Valley pollution problem, and shows how the state, in trying to protect its own legitimacy, lent legitimacy to the polluter.

Chapter 8 tracks the strategies that ISCOR (and its successor Mittal) adopted in the face of challenges from the communities in Steel Valley, and how its strategies fitted in with those of the regulator. It also attempts to understand ISCOR's reactions in the light of its history, organizational culture and the often extreme changes it went through as it changed from a comfortable and confident parastatal under apartheid, to a threatened

steelmaker suddenly absorbed into the global networks of international capitalist competition. It shows how the principle of limited liability had become a culture for ISCOR, as it is more broadly for industry and mining in SA. The chapter notes strong elements of dissimulation in ISCOR's strategies, but also coercive control over the circulation of information (knowledge), censorship and denying citizens the right to participate in decision making. ISCOR's successful exclusion of its neighbours from decision making facilitated first externalization of pollution costs (imposition of pollution), and then enclosure of the resources of Steel Valley.

Chapter 9 explores how the EJ movement in SA responded to this situation. The EJ response is in answer to, and providing an alternative to, the strong framing of pollution as a necessary and legitimate sacrifice of the interest of some: the sacrifice of the health and livelihoods of neighbouring or fenceline communities. This chapter describes the tactical terrain that the pollution dispositive creates for EJ activists, and how the Vaal Environmental Justice Alliance responded to this terrain both in the Vaal Triangle and global solidarity. From a historical perspective, the response from fenceline communities in solidarity with the international EJ movement is discussed here as the fourth and final phase of the case study; a period from 2002 to 2009, in which the polluter itself changed from a privatised national parastatal to a subsidiary part of the world's biggest multinational steelmaker. The chapter describes how the Vaal Environmental Justice Alliance (VEJA) is nurtured by the global movement for Environmental Justice, and in turn contributes to it. It describes a form of power, solidarity, which is quite different from the discursive power belonging to Mittal and buttressed by the state. This chapter argues that the discursive power of the polluter is monologic, manipulative and instrumental, while VEJA and the Environmental Justice movement built a power that is collective, reasoned through by sharing experience and questioning – both in terms of the immediate pollution and in developing frameworks that explain the social causes of the pollution, and alliances across a spectrum of political philosophies, but increasingly clear on the social causes of the pollution.

Chapter 10 brings together the insights about strategies and tactics of discursive power developed in earlier chapters; to venture a description of the pollution machine as it became visible, but also as it developed, during the Steel Valley challenge. With this description, it becomes possible to understand the "unreasonable events" in Steel Valley with which this case study opened: why it was possible to deny the existence of the pollution, and to escape liability for it. It is also upon this understanding that the next steps depend: describing a strategic terrain for EJ activists and identifying other cases in which this logic may apply. The chapter then broadens the horizon of discussion to explore the background and the conditions of possibility of the Steel Valley pollution dispositive. It pays attention to the histories and internal dynamics of broad institutions that constitute the pollution dispositive and the discursive resources and strategies that sustain them: the discourses enabling limited corporate liability, growth and environmental management. Finally, chapter 10 reflects on whether the case study achieved its objectives set out above. It asks whether the Steel Valley case study was adequately explained by this study, and whether the EJ understanding of role of discursive power usefully extended. It looks at possible application of this analysis to other situations, all bounded by MEC, and thus within this pollution framework. It closes with a consideration of the theoretical and methodological contributions to the analysis of pollution achieved through this study.

Chapter 2: The social construction of pollution.

Introduction: Knowledge, power and pollution

This chapter develops the theoretical foundation for this case study. It enables the description of discursive actors and discursive resources, their creation, access, use and deployment in arenas in which discursive contestation take place, what tactics are chosen, and how the strategies are enabled and constrained by material power. In the tradition of grounded theory (Babbie and Mouton, 2001), its aim is to create a conceptual approach capable of synthesising these descriptions to explain the nature of a strategic terrain for pollution struggles, and to present a holistic view of a pollution dispositive or pollution machine (Jaeger, 2001) – a complex of practices that produced and legitimised pollution - that could be seen at work in the Steel Valley pollution struggles.

The chapter shows how pollution is socially constructed. It starts by investigating the elements that make up the pollution chain from source to impact in the environment, and showing how these elements are constructed through knowledge work. The processes of meaning making, the embedding of assumptions in discourse, and the framing of discourse, have been studied extensively by Critical Discourse Analysis. An overview of this tradition and its intellectual roots forms the next part of this chapter. The choice of working broadly within the Critical Discourse Analysis approach, invites a consideration of the criticisms that have been levelled against it (Breeze, 2011; Haig, 2004; Blommaert, 2001; Widdowson, 1995). The focus then moves to how discursive power not only shapes our view of the world, but is profoundly involved in shaping the material world through a myriad of decision making and planning processes. A general discussion of social power leads to a discussion of Foucault's (1980) description of a "dispositive" in which both discursive and material power are taken into account. Then, two prominent discursive resources in this case study - chemistry and medicine - are considered as authoritative discourses enabling and constraining social actors to deal with the two

fundamental questions in this study: the existence of the pollution in Steel Valley and its consequences.

Constructing the pollution chain

Pollution, fundamentally understood as a chemical and biological process: the introduction of harmful substances into the environment (Holdgate, 1979), is often not immediately observable. Knowledge of pollution is based on an understanding of signs and knowledge. Moreover, by definition it involves judgements of whether substances are harmful, and to what degree (Van Loon and Duffy, 2005; Pepper *et al*, 1996). Signs can be physical such as smokestacks, smells in the air, the appearance of water or consequences: sickness and death in people, animals and plants. These signs must be analysed and aggregated before pollution can be claimed to occur, and even more rigorously, before evidence of pollution exists and legal consequences can follow from claims of pollution, whether these be civil (e.g. compensation), criminal (state prosecution) or administrative (withdrawal of permits to use water, or more broadly decisions about residential suitability of an area, and relocation or remediation).

This process of assembling signs into effective knowledge is the work of pollution discourses, and the experts working in these discourses. A number of knowledges and disciplines have the authority to interpret pollution signals in order to construct the pollution chain or pollution path from source, through environmental pathways, to impacts. These are the natural sciences using chemistry, as well as impact sciences, most interesting among them medical knowledge and its ethical dimension in the duty of care. A second set of discourses provide the terms and arenas in which decisions are taken about what to do about the pollution, once it is accepted to exist. Prominent here are legal and administrative discourses, and public opinion and the media.

How is valid and useful knowledge of pollution constructed? To understand any pollution process, one must consider

- the sources or characteristics of the processes that lead to pollution,

- how the pollutants or waste streams travel through the environment,
- how they can be transformed in this pathway,
- how people or components of eco-system are exposed to them, and
- what the effects are (Crone, 1986).

Along the way, we encounter many uncertainties, gaps in knowledge and knowledge games that are part and parcel of constructing and disputing pollution chains from source to victim. These uncertainties and tactics combine to provide opportunities for a politics of pollution knowledge.

Sources of pollution

There are many uncertainties along the pollution chain which create opportunities for both industry and regulators to escape liability and responsibility. However, the impression should not be created that it is impossible to construct a persuasive chain of evidence of pollution, in spite of these challenges. The first issue relates to sources of pollution, and therefore liability.

- The emissions of pollutants may be underreported, or reported but kept secret by the regulator (Scorgie, 2004).
- Emissions may escape monitoring in many ways. Heavy loads of pollutants could be flushed out in periods between sample takings, or during floods. Pollutant loads could be diluted by adding clean water (Van Eeden, personal communication, 2006).
- Accidental releases add to pollution loads, but are often not calculated into emissions.
- Sampling sites may be consciously or inadvertently placed so as to avoid ascribing responsibility to specific polluters.
- Emissions may not carry chemical markers, or pollution monitoring may not be designed to pick up such markers, leaving polluters free to claim that there are other sources of the pollutants, and that they (the polluters) are not responsible. In the 2001 court case, for example, ISCOR argued that the cadmium found in the

bodies of Steel Valley residents could have come from motor vehicles on the nearby Golden Highway.

- There are far more possible pollutants than authorities test for (Jasanoff, 2003).

Pathways of pollution

There are also many uncertainties about the pathways that pollutants follow through the environment. Pollutants can become more or less toxic as they go through these pathways:

- Pathways depend on the environment, for example the geology of underground water (aquifers and how they are connected), prevailing winds and dispersal patterns. This geology may be unknown, or subject to dispute as in the ISCOR case.
- Chemicals may undergo transformations in the environment, making them more toxic and easier to absorb in a human body, for example mercury in organic form in Minemata Bay (O'Neill, 1993), or breaking them down into harmless constituents.
- Human activity may influence these pathways, for example pumping of boreholes can draw deep lying pollutants to the surface.
- Some pollutants such as heavy metals accumulate both in river systems (for example in the sediments where they can be remobilised by floods, loss of water cover or acidic conditions) and along the food chain, for example in fish that can concentrate them a thousand fold, and could then be eaten by people (O'Neill, 1993).
- Synergistic toxic effects (when all the pollutants add up to attack the body) are not accounted for by standards of chemical purity, and need to be established by testing for overall toxicity. Such tests were rejected by ISCOR when proposed by Dr Van Eeden, for example (see chapter 8).

Exposure and vulnerability to pollution

Exposure and vulnerability differ between individuals.

- Exposure to pollutants is generally via the respiratory system, the digestive system, and the skin. Effects are different for each of these.
- In general, the elderly, the young and those with compromised health are more at risk. Babies under six months are vulnerable to nitrite because their blood chemistry differs from older individuals (O'Neill, 1993).
- People with respiratory problems such as asthma are far more sensitive to air pollution (Elsom, 1996).
- People who have grown up in an already polluted area have been exposed to these pollutants from birth – such as people in the Vaal Triangle – and are more susceptible to further pollution.
- Smokers already take in heavy metals and other pollutants (O'Neill, 1993). But should this give a neighbouring industry license to pollute them more, or should it make the industry more careful?
- The body protects itself from pollutants, e.g. some heavy metals which are coated with proteins by the body, and then flushed out (Coombs, personal communication, 2006). The pollutants would then no longer be present in the body to be found by medical tests, but would have done their damage.

Toxicological knowledge

Toxicological knowledge in many places is limited, inconclusive or aggressively contested:

- Many chemicals have not been tested at all (Doyle, 2004).
- It is not ethical to conduct toxicological experiments on humans by deliberately exposing them to potentially hazardous substances. As a result, animals are used. But this creates uncertainty in applying the knowledge gained from animal exposure to humans.
- Accidental exposures of humans to toxic substances are useful indicators, but are

limited in their usefulness because they are obviously not designed to yield certain knowledge. In these situations dosages, for example, are not clear. These are not experimental but emergency situations in which treatment is the overriding priority (Hamilton and Hardy, 1983).

- There are known cases where those responsible for polluting chemicals have attempted to influence research on the toxicity of those chemicals. Evidence of intimidation and corruption in lead, plastics production and carcinogenics, has been well documented in books such as Devra Davis's *When Smoke ran like Water* (2002) and *Deceit and Denial (*Markovitz and Rosen, 2004).
- Scientific findings may be adjusted for bureaucratic reasons, as documented in the case of *Love Canal: Science, Politics and People*, (Levine, 1982) where the scope of the problem – in knowledge terms - had to fit a predetermined budget for fixing the problem!

Scientists who "cross the line" and join the side of polluted communities, have been known to come under serious pressure (Markovitz and Rosen, 2004; Levine, 1982). Settling questions of pollution in an exact manner is very difficult, and corporations have become skilled at using this to their advantage in escaping liability for their actions (Michaels, 2008). Nevertheless, in an established industry like steel making, where processes and their pollutants have been well known for a long time, it is possible to develop an extensive picture of what forms of pollution are possible in the process of making steel. To illustrate: in the industrial museum in the German Ruhr area (where coal mining and steel making were the basic industries), the damage that sulphur dioxide does to tree leaves was noted in botanical detail as early as 1883 (Schaier and Stemmrich, 1997).

The social construction of pollution

Expert discourses are not the only discourses which construct pollution. Everyday, community or lay constructions of pollution are also important in this process, because they bring the pollution issues into political circulation, thereby setting public and

political agendas for action (Hannigan, 1995) as they argue that people and their environments should be protected against the pollution, and for rehabilitation or compensation. These lay constructions of pollution (explored in chapter 6) are not usually accorded the same authority as the scientific discourses, a situation which becomes clear when the polluted push for action about the pollution by exerting pressure on both the polluter and the state in its role as protector of its citizens. They have a *folkloric* character, which means that they are not always factual, and may incorporate narrative elements for dramatic effect, or to press certain claims (Scott, 1985). However, they do play an important role in influencing public opinion, and they may achieve scientific authority through the use of citizens' science (for example, Gibbs, 1995).

Environmental claims making is the focus in the "social construction of environmental risk and knowledge" approach in sociology (Hannigan, 1995: 178). This approach sees the environment as "a site of intersecting and competing social and cultural definitions and interests". What is contested is:

> "the nature and gravity of environmental threats, the dynamics underlying them, the priority accorded one issue versus another and the optimal means for mitigating or ameliorating conditions which have come to be defined as problematic. The parties involved in the contestations include private industry, government, regulators, scientists, environmental groups, community organizations, trade and professional groups and, increasingly, grassroots 'victims'. What is ultimately most significant here is the process through which environmental claims-makers influence those who hold the reins of power to recognize definitions of environmental problems, to implement them and to accept responsibility for their resolution" (1995: 185).

Discourse analysis: the study of the construction of meaning

The broad field of study of the construction of meaning is discourse analysis. It brings together, and is nourished by, a number of different traditions or subdisciplines. "Ethnomethodology, conversation analysis, sociology of scientific knowledge,

poststructuralism, communication, linguistic philosophy" are the subdisciplines that are specifically identified as approaches closely related to discourse analysis applied in social psychology, in Wood and Kroger's *Doing Discourse Analysis* (2000: 19). In a two volume overview edited by Theun van Dijk (1997), discourse analysis is understood to include, amongst others, rhetoric, narrative analysis, argumentation, social cognition, discourse semiotics, semantics and grammar, and the analysis of organisational and institutional discourse.

The approaches listed above vary immensely in scale. At the microanalysis end of the spectrum one finds an interest in individual meaning making (Riesman, 1993) and the art of conversation, for example turn taking and face saving conventions (Wood and Kroger, 2000). There are critical discourse studies on the organisational or institutional level (Mumby and Clair, 1997; Berkenkotter, Huckin and Ackerman, 1991) as well as macro-analytical approaches which connect discourse analysis to the study of ideology (Fairclough, 1995; 1989; Thompson 1990; 1984).

Discourse analysis is also close to, and has specifically imported many techniques from rhetoric and narrative analysis. The study of rhetoric comes from the slave-owning, "democratic" Greek city states, also the place of origin for the words politics, policy and police (Habermas, 1996). Rhetoric was specifically taught as the art of political persuasion. Over time it has developed into an analysis of mainly political discursive interventions. It focuses on (1) the intervention (classically a speech), (2) the persona that the speaker projects, and (3) the reason for the speech, called *exigence, something found in the context that explains not only the reason for the intervention as a whole, but also the choices in rhetorical techniques and persona projection* (Gill and Whedbee, 1997).

Rhetorical studies bring two things into focus: a political situation and persuasive or rhetorical means. Now it is used in a wide variety of contexts as well as interrogating the rhetoric of politicians. The expression "rhetoric" is nowadays commonly used in the sense of rhetoric vs. facts or real intentions, rhetoric as a cloak (Gill and Whedbee, 1997). The popular phrase "empty rhetoric" expresses distrust of political speech. The use of

rhetoric implies the existence of a ruling elite powerful enough to impose and naturalise a communication situation of monologic "speeches" rather than conversation. As political speech aimed at persuasion, rhetoric is one of the oldest instances of monologic or one-sided communication (Bakhtin, 1984), as opposed to the rich, convention controlled, mutual meaning making in the drama of everyday life (Berger and Luckmann, 1973). This important concept will return later in the study:

> "Monologism, at its extreme, denies the existence outside itself of another consciousness with equal rights and equal responsibilities, another I with equal rights (thou). With a monologic approach (in its extreme pure form) another person remains wholly and merely an object of consciousness, and not another consciousness. No response is expected from it that could change anything in the world of my consciousness. Monologue is finalized and deaf to other's response, does not expect it and does not acknowledge in it any force. Monologue manages without the other, and therefore to some degree materializes all reality. Monologue pretends to be the ultimate word. It closes down the represented world and represented persons" (1984: 292).

Narrative analysis is often used in psychology and ethnology, where it is primarily applied in the personal sphere, but can be used to tease out broader political patterns (Riessman, 1993). The study of "master narratives" is an approach often used in the analysis of mass media news reporting, cultural and development studies.

At the basis of narrative analysis is the observation that meaning making through narrative is a ubiquitous human activity, and part of everyday life (Berger and Luckmann, 1973; Goffman, 1969). This has two immediate implications. One is that since meaning making is very widespread and continuous, it is also irrepressible, and defensive strategies that re-interpret situations, or resist dominant interpretations, are both possible and likely (Scott, 1985). Its methodological implication is that narrative structure – and with it, various conventions for making and understanding meaning - is equally ubiquitous and available for interpretation. This has an important political implication, which will be central to this thesis: namely that agency for developing and using discursive power also resides with people who are not part of the elite, and may in fact be

their victims, as in fenceline communities. Paolo Freire's pedagogy of the oppressed or "conscientisation" approach, aims precisely at making it possible for people to actively enter the historical process as responsible subjects, subjects in the sense of actors creating their own history (Freire, 2000).

Academic Critical Discourse Analysis can be interpreted as an intensified form of dialogic communication which intends to reveal power operations hidden in discursive practice, in order to bring these mechanisms to awareness to the subjects they operate on, and thereby denying these mechanisms their coercive power (Fairclough, 2009; 1995; 1992; 1989; Jaeger, 2001; Meyer, 2001; Janks, 1997). The "critical" in CDA refers to the political commitment of CDA scholars to unmask power through analysis. CDA has a clearly articulated emancipatory intention: "CDA scholars play an advocatory role for groups who suffer from social discrimination" and "endeavour to make explicit power relationships which are frequently hidden" (Meyer, 2001:15). Critical theories aim at making agents aware of hidden coercion, thereby freeing them from that coercion and putting them in a position to determine where their true interests lie. It also requires critical discourse analysts to be self-reflective and declare our own agendas upfront.

The linguistic turn

Discourse analysis is part of a broader awareness in the social and related sciences of the formative role of language in knowledge formation and use. The linguistic turn marks a change in approach to analysis. According to Wood and Kroger (2000, 3):

> "Discourse analysis is a perspective on social life that contains both methodological and conceptual elements… language is taken to be not simply a tool for description and a medium of communication (the conventional view), but as a social practice, as a way of doing things."

Catherine Riessman argues against the view of language "as a transparent medium, unambiguously reflecting stable, singular meanings." She reports that:"… critics of the realist assumptions of positivism challenge these views of language and knowing and provide the philosophical underpinnings of narrative studies. Sceptical about a

correspondence theory of truth, language is understood as deeply constitutive of reality, not simply a technical device for establishing meaning…" (Riessman, 1993: 4).

This perspective has far reaching consequences, as Frank Fischer and Jon Forester illustrate in the politically sensitive arena of policy analysis:

> "What if our language does not simply mirror or picture the world but instead profoundly shapes our view of it in the first place? If analysts' ways of representing reality are necessarily selective, they seem as necessarily bound up with relations of power, agenda setting, inclusion and exclusion, selective attention, and neglect. If analysts' ways of representing policy and planning issues must make assumptions about causality and responsibility, about legitimacy and authority, and about interests, needs, values and preferences, and obligations, then the language of policy and planning analyses not only depicts but also constructs the issues at hand" (1993: 3).

Norman Fairclough underlines the double effect that this theoretical point of departure has. Language use is socially determined, as well as determining social reality:

> "Linguistic phenomena are social in the sense that whenever people speak or listen or write or read, they do so in ways which are determined socially and have social effects… Social phenomena are linguistic; on the other hand, in the sense that the language activity which goes on in social contexts (as all language activity does) is not merely a reflection or expression of social processes and practices, it is a *part* of those processes and practices. For example, disputes about the meaning of political expressions are a constant and familiar aspect of politics. People sometimes explicitly argue about the meanings of words like *democracy, nationalisation, imperialism, socialism, liberation* or *terrorism*" (Fairclough 1989, 23).

These fundamental theoretical and ontological perspectives resonate with those of Environmental Justice analysts, like Pena (2005), who argue that EJ fundamentally challenges positivism, as noted in chapter 1. The work of Critical Discourse Analysis is to take these insights and use them to unmask the ideological assumptions that are embedded in a positivist understanding and use of language (Fairclough, 1989).

Discursive resources and their use

Discursive resources, contained in discourses, make possible the use of discursive power as a result of previous work, for example through research and experimentation and access - at crucial times privileged access - to these discursive resources. Again, material power determines or at least influences such access. This view of discourse as perspectives, schools of thought, and treasure houses of concepts is expressed in the work of Dryzek:

> "A discourse is a shared way of apprehending the world. Embedded in language, it enables those who subscribe to it to interpret bits of information and put them together into coherent stories or accounts. Each discourse rests on assumptions, judgements, and contentions that provide the basic terms for analysis, debates, agreements and disagreements… Indeed, if such shared terms did not exist, it would be hard to imagine problem solving… as we would have to return to first principles continually" (Dryzek, 1997: 9).

Fairclough (1989) has formulated a similar notion which he calls "members' resources". *Members' resources determine our ability to produce and interpret discursive interventions.*

Discourse analysis as texture

In practice, most Critical Discourse Analysis is oriented towards textual analysis. Fairclough argues that detailed linguistic analysis should always be part of discourse analysis, because it is in the linguistic construction of texts that "ideological work" takes place. He remarks on the increasing number of discourse analysts working outside linguistics or language, and argues that discourse analysis should continue to mean (Fairclough, 1995: 2):

> "analysis of the texture of texts, their form and organisation, and not just commentaries on the 'content' of texts which ignore texture. The premise of this argument is that the sorts of social and cultural phenomena that such analysts are orientated towards are realized in textural properties of texts in ways which make them extraordinarily sensitive indicators of sociocultural processes, relations and change. Social and cultural analyses can only be enriched by this textural evidence, which is partly linguistic and partly intertextual – partly a matter of how links between one text and other texts are inscribed in the surface of the text."

> Texture includes "a range of properties of texts (which can be regarded as potentially ideological) … including features of vocabulary and metaphors, grammar, presuppositions and implicatures, politeness conventions, speech-exchange (turn-taking) systems, generic structure and style" as well as broader properties such as absences, implicit assumptions … (Fairclough, 1995: 3).

This approach makes it possible to find reflections of power relations in text. Thus, "analysts of political discourse frequently find that pronouns and the meanings associated with them give a kind of a map of the socio-political relationships implicit in a discourse" (Chilton and Schaeffner, in Van Dijk, 1997: 216). The first person plural pronouns – "we", "us", "our" – are linguistically open to slippage. Is the "we" inclusive or exclusive? How far does it include? "We" often brings a sense of community, "we the nation, we as South Africans", and reflects on a textual level Thompson's strategy of "legitimation". In this thesis, the first person plural is used as an authorial focaliser: an acknowledgement that the author accompanies the readers through this text.

Descriptions can carry strong ideological meaning – for example, are South Africans citizens, clients or customers when they use water services? (Ruiters, 2002). Metaphors can link ideas that are actually dissimilar, and not linked by rational argument, thus achieving a type of overpowering or coercion and not rational discussion. Syntax, the way sentences are constructed, can, for example, hide causality – that is who is responsible for an action or decision - by using a passive construction. This is important in questions of credit or blame. The imperative of coherence, where the reader is forced

to activate certain assumptions to make sense of a text can be a sleight of hand to "naturalise" these assumptions (Fairclough, 1989).

The creation of authority to speak (and be taken seriously) includes knowledge, qualifications, and legitimacy in the sense of representativity, an area of constant contestation between different speakers and audiences. Description of situations, naming of subjects, and implied narratives can, through analysis, be very revealing of political intentions which are implied but not spelled out. An extensive list of these linguistic features is available in Janks (1999).

Criticisms of discourse analysis

With its origins in the 1970s, it is inevitable that Critical Discourse Analysis would have attracted a number of criticisms (Breeze, 2011; Haig, 2004; Blommaert, 2001; Widdowson, 1995). In her recent overview of such criticisms, Breeze (2011) states that

> "Critical Discourse Analysis offers a promising paradigm for identifying and interpreting the way ideology functions in and through discourse. Its particular strength is that it bridges the gap between real language phenomena and the workings of power in society." (Breeze, 2011: 520)

However, she cautions against risks identified by seven main types of criticisms levelled against this approach – for both practitioners and readers of CDA analyses. It would thus apply to readers of this thesis as well. I quote Breeze's comments (with comments of other critics), and then give responses relevant to this study.

1. "Critical Discourse Analysis is fundamentally defined by its political aims. Researchers are usually explicit about their political commitments, at least in a general sense. These commitments should always be borne in mind when we interpret their work" (2011:520).

This study is very open about its political commitments to the Environmental Justice movement, its intention to contribute to it by describing the tactical terrain of the discursive struggle for Steel Valley, as well as the influence of the author's participant observation in this struggle as a means of creating this case study (see chapter 3).

2. "Critical Discourse Analysis draws on a wide range of theories about language and society. These theories are not always clearly defined, and there is a tendency to draw on an eclectic mix of concepts from different intellectual traditions, not all of which are compatible. Researchers should endeavour to clarify the theoretical background to their work, while readers should feel free to adopt a critical stance towards the theoretical apparatus encountered in CDA studies, or even to challenge its bases" (2011:520).

A number of critics have raised this point, including Widdowson (1995). Breeze argues that "… this could lead to a situation in which the arguments from philosophy, politics and sociology are not fully worked out in terms that would be satisfactory to specialists in these disciplines, nor are the bases for language analysis firmly established in a way that is recognised by linguists" (2011:501). Norman Fairclough's work, which serves as the foundation of my approach, does indeed bring together theories from Gramsci, Habermas, Marx and Foucault.

A particular problem is identified with the inclusion of Foucault, whose work is seen as relativistic (Breeze, 2011). I disagree with this reading. Foucault refrains from moral judgements, but certainly pays close attention to material detail in his historical case studies (Foucault, 1973; 1980). A similar emphasis on material detail in this study flows from a quest for adequate certainty about pollution sources and impacts. A central concern in this study is with citizens' science, which does not see the reality described by science as indeterminate, but as contested (Irwin, 1995). Citizens' science aims at an understanding for citizens, or forensic evidence in courts or for government, not at a post-modernist uncertainty.

Moreover, while Foucault does not make judgements about the moral superiority of one discourse over another, his historical studies clearly indicate which orders of discourse are dominant in a certain age, which is the concern in this study as well; especially in chapter 10 which discusses currently dominant discourses that enable the legitimation of pollution.

In this study – see the relevant sections below – an attempt is made to specify exactly which concepts are drawn from which traditions. Faircloughian and Foucaultian analyses are merged in this study by establishing an equivalence between "members' resources" (Fairclough, 1989), discursive resources (Dryzek, 1997) and discursive resources as "conditions of possibility" for a pollution dispositive (Jaeger, 2001).

3. "CDA practitioners have frequently been accused of using "impressionistic" methodology for analysing text. Care should be taken to apply the same standards of rigour when handling language data as in any other area of linguistics. One solution might be to apply the techniques of corpus linguistics, in order to obtain a more representative overview across a larger sample of language. Another might be simply to be less selective and more disciplined and systematic in analysing the text. Particularly when spoken language is analysed, the pragmatic dimension should always be taken into account" (2011: 520).

This study does not undertake textual analysis (see below in next section) therefore this criticism is not considered further.

4. "Critical discourse analysts have sometimes been said to move too quickly from the language data to the stage of interpretation and explanation of those data in terms of social theory. If this is the case, then readers should take care to test interpretations against the available data objectively. In general, researchers need to do justice to the text itself, so that their interpretations are well-grounded" (2011: 520).

I agree with this criticism of CDA in general, as is also made explicit in the work of Blommaert (2001). The role of social theory receives special attention in this chapter, in the form of both social constructionism and political ecology. In addition, the historical

emergence of the Minerals Energy Complex and its impacts on the broader study area, the Vaal Triangle, are described to provide a strong political and material context to the analyses of *discursive encounters, arenas and strategies* which constitute the main work of this thesis (see appendix1). The development of these concepts – in the next chapter – was felt to be necessary to move the analysis into closer connections with social theory.

5. "CDA has an inadequate theory of the way texts work in social contexts. Reader response or audience reception is often naively assumed on the basis of the researcher's interpretation of the text. Readers should contrast conclusions of this kind with work carried out in media studies which provides deeper insights into the relationship between texts and subjects. CDA researchers need to pay more attention to this dimension, and find ways of exploring real responses" (2011: 520).

6. "Though critical discourse analysts have always widened their field of vision to the macrocontext, they have sometimes paid insufficient attention to features of the immediate context, which has led to interpretations which are pragmatically inappropriate or remote from the concerns of the participants. The specific features of the immediate context should be treated seriously by readers and researchers alike" (2011: 520).

By focusing its analysis on discursive events in discursive contestation, this study strongly foregrounds the immediate context, namely the arenas for discursive and political struggles about the existence and consequences of the pollution in Steel Valley (see chapter 3). This is strengthened by strong attention to social theory and historical and geographical specifics, normally not so prominent in Critical Discourse Analysis. The study also pays attention to the relationship between discursive and material power. In this way, the study moves closer to Blommaert's suggestion that CDA should pay less attention to text and more to social relations and power structures, so that it becomes possible to "explain… society through the privileged window of discourse" (Blommaert, 2001: 28). Blommaert, who studies the power relations reflected in the discursive practices of political refugees in Belgium, encourages attention to linguistic resources and power distribution in society, as well as to how discourses shift across contexts, in this

study exemplified by the effects of a number of documents moving from confidential status to public domain as the result of both court cases (where they become public as part of evidence – see next chapter) and whistle-blowing activities (Van Eeden interview, 2005). These effects are particularly important in pollution studies, such as this one (Punch, 1996, see below in chapter 3). Finally:

7. "In the last twenty years, CDA has mainly researched the way ideology works through discourse to maintain unequal power structures. Perhaps because of CDA's self-image as a "critical" force, the focus of this work has been overwhelmingly negative, and seems to propagate a deterministic vision of society. Discourse analysis that explores emancipatory discourses or positive changes in social language use would be useful, because it would provide information about the way that positive transformations can be brought about" (2011: 521).

The activist use of discourse analysis in this study is both deconstructive and reconstructive. While it seeks to reveal the workings of a pollution dispositive, its ultimate aim is emancipatory: to contribute to a project that will enable environmental justice activists to recognise and use discursive power to establish socially and environmentally just relationships within society, with other species and within broader ecosystems. This is evident in chapter 10, below.

Use of discourse analysis in this study

A major practical disadvantage of the strictly linguistic approach to Critical Discourse Analysis lies precisely in its detailed attention to individual texts, which makes it inappropriate as an overall method for this study, which covers a broad range of interactions over a period of 15 years. While some textual properties will receive attention where they are particularly revealing of relationships between participants, or strategic orientations, the main focus in this thesis will be on a less explored aspect of CDA, namely discursive resources and their use in discursive contests.

Within CDA, textual properties are seen as related to production and interpretation processes which rely on the outcomes of previous struggles over discursive power, which are part of the political economy, and an important instrument of reproduction, since it is a privileged activity for the construction and reconstruction, as well as struggles over, hegemony (Fairclough, 1989; 1995). This study focuses on these two aspects: discourses as resources for the creation and exercise of discursive power built up through previous investments and struggles, and control over circulation or availability of knowledge (information). Also, there is a direct interest in how these resources are distributed, can be accessed and used. The study thus stays within the framework suggested by the work of Fairclough, where he gives attention to the conditions of possibility of productive and interpretive processes, that is "members' resources" and how discursive practices are determined by "other, non-linguistic, parts of society" (Fairclough, 1989: 24). It has been observed that these non-textual areas are often neglected or interpreted in vague terms in standard CDA analyses (Blommaert, 2001). In conclusion, this study, while remaining within the broad school of CDA by internalising "the linguistic turn" into its analysis, can also usefully be located between CDA and social constructionism (Robbins, 2004; Hannigan, 1995; Bijker, 1995) in which the methods for analysis are not as fine-grained as the linguistic textual analysis, but can cover a far wider field of observation.

Discursive and material power

The focus now turns to the relationship between discursive power and material power. There is a close connection between discursive and material power. Discursive power cannot be understood in isolation from material power (Harvey, 1996; Fairclough 1995, 1989). There is also a close connection and interpenetration between discursive power, aimed at creating or maintaining consent, and directly coercive power. If consent is the velvet glove, it has no shape and no place without the iron fist underneath. It is material power that shapes the platforms, networks and resource bases of discursive flows, and can interrupt them.

The exercise of discursive power requires a material basis (Thompson, 1990; 1984). This includes the technical basis for public opinion: mass media in the form of broadcasting equipment, printing presses, paper factories, distribution networks, to the enforceable nature of law with courts, legal practitioners, prisons, police, to money and control over space in the form of public and private property, roads and verges, public meeting places and surveillance (Herman and Chomsky, 1994; Foucault, 1982).

This material aspect of discourse also points to the politics of circulation of information: who has access to information, and who may legitimately use it (Fairclough, 1989). Considering this aspect moves the analysis from the strictly discursive to the broader political economy. Fairclough's analyses link texts into the political economy where they have their conditions of possibility in the historical investments that had been made in monitoring, and research and intellectual development, as well as the training of scientists, policy analysts and other experts.

Control over the circulation of information can be as crude as direct censorship in which physical sanctions are used, for example arrest for possessing banned information, or subtle: the exclusion from decision making through "games" played to prevent access to information, such as the case of the ISCOR Master Plan, discussed below (chapter 3). Invoking censorship also moves the rules of contestation from consent to coercion and thus to the edges of a politics of hegemony. However, hegemonic politics do not supersede a political economy and material coercion; they merely displace these mechanisms into the background or use them less. Hegemonic politics display a preference for discursive mechanisms to create consent (Foucault, 1982).

At the same time discursive power constitutes power in the political economy (Fairclough, 1989), both through management instructions (Jessop, 1990) and legitimation exercises (Fairclough 1995; 1989; Thompson, 1990; Offe 1984). This power becomes more central and influential via discussion and public opinion (Habermas, 1996) in a constitutional democracy, and more so in a participatory democracy. In South Africa,

the establishment of a constitutional democracy since 1994, led to expectations of participation in decision making. A number of processes formally require public participation – such as described in the National Environmental Management Act (NEMA) to Environmental Impact Assessments (EIAs) to water permit applications. Such decisions require public participation, although there is no assurance that this participation will materially alter the intentions of applicants or decisions of officials (see chapters 6 and 7).

The sociology of power

Although there is expansive sociological discussion of power and ideology, much sociological discussion of power does not investigate the differences between material and discursive power specifically (Etzioni, 1993; Olsen, 1993; Mann, 1986). In a textbook on power, Olsen and Manger (1993) make a passing distinction between "tangible" and "intangible" resources for the exercise of power (Olsen and Manger, 1993: 6).

Discussions about power in sociology start from the point of view that every social act is an exercise of power, in the sense that social interaction contains the idea of social factors affecting or influencing each other (Olsen, 1970). However, for the idea of power to be useful – and to correspond to its common sense meaning – the element of overcoming resistance (or some form of conflict) is necessary. Thus Olsen, while acknowledging that there is no commonly accepted definition of social power, writes that "the essential idea is that *power is the ability to affect the actions or ideas of others, despite resistance*" (italics in original, 1993:1). Etzioni's definition of power expresses this clearly: "Power is a capacity to overcome part or all of the resistance, to introduce changes in the face of opposition (this includes sustaining a course of action or preserving a status quo that would otherwise have been discontinued or altered)" (1993: 18).

Mann (1986) defines power as mastery: "In its most general sense, power is the ability to pursue and attain goals through mastery of one's environment" (Mann, 1986: 6). This mastery may involve co-operation with other people, for instance in dealing with harsh environmental conditions, but also may involve competition or conflict. Mann thus distinguishes two types of social power. The first one is collective power, the oldest form of power which arises through co-operation, "whereby persons in cooperation can enhance their joint power other third parties or over nature" (Mann, 1986: 6). Collective power is described by Bogason (2000: 43) as "any kind of action involving more than one individual interested in achieving the same goal without competing with one another or dominating one another". Bogason's definition imagines a type of power that does not involve domination or "power over".

The other type of power is distributive power, also known as zero-sum power, where one actor imposes his will on another. This is the type of power that attracts most attention, since it is closest to the sense of power as domination. However, Mann notes that in practice, "in most social relations both aspects of power, distributive and collective, exploitative and functional, operate simultaneously and are intertwined… Indeed, the relationship between the two is dialectical" (Mann, 1986: 6). For example, because of the need for supervision and coordination in implementing collective goals, the possibility of distributive power (dominating, zero-sum or elite power) is set up at the heart of the dynamics of collective power. It is possible for leaders of a social movement or a revolutionary or liberation government to turn the solidarity of collective power into distributive power by virtue of hierarchies, exclusionary circulation of information and organizational protocols. This means that "the few at the top can keep the masses at the bottom compliant, provided their control is institutionalised in the laws and the norms of the social group in which both operate" (Mann, 1986: 7).

But solidarity power can be persistent. In this study, this persistence is linked to the concept of "communicative rationality", as developed by Habermas (1992; 1996), a philosopher in the second generation of the Frankfort school and thinker about the "public sphere" (Habermas, 1992; 1996; Romm, 2001). Habermas argues that by entering

into a discursive situation, participants implicitly undertake to strive for the conditions of an ideal speech situation, which are:

> "…to develop… a consensual understanding of the issues under consideration, in which claims to both truth and rightness are opened to validity checking, as well as claims to the sincerity and authenticity of the speakers" (Habermas 1982: 235, as quoted in Romm, 2001:145).

This is the ideal of discursive democracy (Dryzek, 1990). However, it is common knowledge that much communication is insincere, implying that in everyday situations an untheorised version of Habermas' conception of communicative vs. strategic uses of language is available to judge and defend oneself against this lack of sincerity. Strategic communication, as defined by Habermas, is communication that strives for acclaim (Habermas, 1996). It is manipulative because its objective is the acceptance of a message as the message was intended by the sender, and is not open to "dialogic" negotiation. This type of communication is often used in "public relations", advertising, corporate communication generally and in political communication that limits democracy to gathering votes (representative democracy in its minimal sense).

In contrast, the communicative use of language builds understanding, because claims can be tested and verified for coherence, sincerity and impartiality, Habermas' tests for "communicative rationality". Bakhtin (1986) opposes these two types of communication as dialogic (free and willing exchange of ideas and perspective) and monologic (an instrumental imposition of a one-sided view). Dialogic communication is crucial to building political power through solidarity.

The power of authority rests on legitimacy. When exercising authority, "an actor draws on a grant of legitimacy made by the recipients as a basis for issuing authoritative directives" (Olsen, 1993:4). The recipients comply voluntarily (without being forced), and they can also withdraw the legitimacy. Authority is a stable, least cost, consensus based and hegemonic form of power (Olsen, 1993). It is useful because authority

becomes routine and no extra force is needed to impose it (Foucault, 1982; Lukes, 1974 in Olsen, 1993). Olsen quotes the four bases for authority described by Weber: expertise, formal legal rights, traditional beliefs and charismatic leadership (Weber 1922 in Olsen 1993). This authority based on legitimacy requires a dialogic process (although not necessarily sincere and free of instrumental rhetoric) as legitimacy needs to be created and maintained. Strategic, insincere or manipulative communication erodes legitimacy because fundamentally, legitimacy has to be granted, it cannot be enforced. Repeated abuse of legitimacy erodes legitimacy.

Lukes (1974 quoted in Olsen 1993) draws attention to differences in how observable and therefore how "natural" different exercises of power appear to be. First he distinguishes a clearly observable power, for example in making and implementing decisions, often leading to clearly observable conflict. The second level is partially hidden, when actors prevent activities or decision making. Here discursive power plays an important role, as Olsen remarks: "Some actors, especially those who occupy positions that give them considerable resources, may define certain topics as "nonissues" that are closed to discussions or certain actions as "illegitimate" that may not be considered" (1993:4). Through their control of arenas of discussion, these actors prevent discussion. The third level involves "the ways in which actors shape the broad social contexts in which others act, thereby making possible some courses of action and preventing others" (1993:5). The third level involves the framing of issues, through its control of overall options available. Framing is a particularly important concept and practice for the Environmental Justice movement. Framing power is particularly powerful, because its use often does not attract outright opposition, due to its invisibility.

Finally, Olsen's summary points to the importance of resources as preconditions for exercising power. The actor who wants to exercise power needs to possess or have access to relevant resources which may be tangible such as "money, property, goods, people, weapons", or intangible resources "knowledge, skills, roles, legitimacy, reputation, appeal" (1993:6). This division again reflects a division between material (tangible) and discursive (intangible) power. Most material resources are finite, so that they impose

constraints on how they can be converted into "power actions" - where to commit soldiers, policemen, scientists or lawyers, where and when to use up provisions or budgets. Mann (1986) bases much of his analysis of how power is exercised on "logistics", an analysis of the constraints of material resources. Olsen remarks that resources such as knowledge and skills may increase with use, which stands to reason as "repeat actors" improve their performance and knowledge of techniques grow as they are adapted from one discipline to another (Foucault, 1982).

The social construction of pollution relies on the availability of previously existing discursive resources, which are created through a heterogeneity of means: academic discourses that create and maintain the concepts for describing pollution, institutions that train individuals in their use and certify them as experts, and the institutions that employ such experts in production and regulation. Together these establish the power of an accepted way of doing things (Luke, 1999; Lukes, 1974), and consequently, for example, an accepted level of pollution and ways of managing (and thus also allowing within certain bounds) pollution.

Discursive resources are deployed in previously constructed – and historically legitimate - arenas that make up the framework of decision making in a modern society: law (the courts), government, public opinion, especially the media. Each of the arenas has different rules for the use of discursive power, including importantly who has authority to speak and be taken seriously. Taken together, these arenas constitute the terrain of struggle about the existence and consequences of pollution.

Material and discursive power in the dispositive

Foucault modelled a method of simultaneous analysis of discursive and material power in his book *Discipline and Punish* (1982), where he describes the discursive complex of imprisonment. Foucault presents a complex picture of the relationship between discourse and power. Each power and discourse complex is unique, and all that can really be taken

from one situation into another is a method of interrogating these complexes. Each discourse has its own, quite specific history, as reflected below by two of Foucault's interpreters, McHoule and Grace:

> "… in any given historical period we can write, speak or think about a given social object or practice (madness, for example) only in certain specific ways and not others. 'A discourse' would then be whatever constrains – but also enables – writing, speaking and thinking within such specific historical limits" (1990:31).

The sense that a discourse is productive, "producing truths", enabling discussions and directions in a practice, and constraining at the same time – which means that it excludes certain ways of observation, analysis and formulation - is fundamental to the Foucaultian view.

The principle of historic specificity also reveals that things could have been different (McHoule and Grace, 1990, 33). This can be a guide for undertaking discursive analysis, resonating with Thompson's notion of "reification" (Thompson, 1990).

> "... I would say also, about the work of the intellectual, that it is fruitful in a certain way to describe that-which-is by making it appear as something that might not be, or that it might not be as it is… recourse to history … is meaningful to the extent that history serves to show how that-which-is has not always been, i.e. that the things which seem most evident to us are always formed in the confluence of encounters and chances, during the course of a precarious and fragile history. … It means that they reside on a base of human practice and human history; and that since these things have been made, they can be unmade, as long as we know how they were made." (Foucault, 1990, 36)

According to Foucault, discourses are knowledges, and knowledges are collected into disciplines (McHoule and Grace, 1993). Disciplines on which Foucault comments, include the human sciences like psychiatry, medicine, economics, linguistics and the study of human sexuality. These bodies of knowledge are disciplines in two closely related senses:

- ways of thinking and speaking on a particular topic, with rules for what can and cannot be said, an internal logic or logics;
- they are also techniques of discipline, of producing individual subjects and institutions.

Discourses have components. These are the objects they study, and their "operations": the techniques of treating these objects, their concepts: the terms and ideas, the unique vocabulary of the discourse, and its theoretical options: the assumptions, hypotheses and theories. The analyst could specifically observe how techniques migrate from one discipline to another and from one institution to another. For example, disciplinary techniques did not emerge as a sudden discovery:

> "It is rather a multiplicity of often minor processes, of different origin and scattered locations, which overlap, repeat, or imitate one another, support one another… etc… They circulated sometimes very rapidly … on almost every occasion they were adopted in response to particular needs, an industrial innovation, a renewed outbreak of certain epidemic diseases, the invention of the rifle or the victories of Prussia…" (Foucault, 1982: 138)

Often these techniques commend themselves to elites through their usefulness in managing people, "whether in a workshop or a nation, an army or a school" (Foucault, 1982, 220). Foucault describes how, in the late eighteenth century, there was "a long elaboration of various techniques" that made it possible to manage people as workers, students, prisoners or soldiers, and eventually as citizens. This enabled managers to supervise workers carrying out complex tasks, but also to achieve political and economic objectives. Foucault relates the invention of disciplinary techniques to the development of capitalism:

> "If the economic take-off of the West began with the techniques that made possible the accumulation of capital, it might perhaps be said that the methods of administering the accumulation of men made possible a political take-off in relation to the traditional, ritual, costly, violent forms of power, which soon fell into disuse and were superseded by

> a subtle, calculated technology of subjection. In fact, the two processes – the accumulation of men and the accumulation of capital – cannot be separated; it would not have been possible to solve the problem of the accumulation of men without the growth of an apparatus of production capable of both sustaining them and using them; conversely, the techniques that made the cumulative multiplicity of men useful accelerated the accumulation of capital…" (Foucault, 1982: 220).

The critical discourse analyst, Jaeger (2001), further developed Foucault's approach of a "dispositive" to deal more explicitly with non-discursive elements of power. Jaeger describes dispositives as strategies that respond to challenges – usually for an elite or aspiring elite – in the political economy (Jaeger, 2001). This complex is heterogeneous: it brings together discursive practices, non-discursive practices and "material manifestations". Discourses form the elements and are the prerequisite of dispositives. Jaeger describes dispositives as:

> "circles rotating in history with three central transit points: 1. discursive practices in which primarily knowledge is transported, 2. actions as non-discursive practices in which, however knowledge is transported, which are preceded by knowledge and/or constantly accompanied by knowledge, 3. manifestations or materializations which represent materializations of discursive practices through non-discursive practices, whereby the existence of manifestations ('objects') only survives through discursive and non-discursive practices…" (2001: 56).

He argues that in this way, knowledge "flows into" raw material to give it shapes that suit those whose strategies it serves (2001: 60).

The concept of the dispositive reflects the idea that human activity shapes society as well as material reality – in a process of ongoing change as well as domination, and struggles for domination. As material reality is shaped, it in turn becomes a resource for domination. An example is the panopticon, an architectural strategy first used for the surveillance of inmates of monasteries and prisons, but then used in factories and ultimately extended to surveillance techniques in society in general (Foucault, 1982).

Architecture is a good example of the connection between the disciplines of planning, and their knowledge components, and hegemonic ideas of the day. This is illustrated in the garden city lay-out in Vanderbijlpark, which combined an elegant international utility discourse with that of racial Fordism, resulting in a layout of native areas of Vanderbijlpark close to work, with a "curio" flair in Bophelong (Vesco, 1984; see also fig 4.3). The town planning of Vanderbijlpark reflected a racialised "garden city" idea accompanying the racial Fordism of apartheid factories. Black workers were placed in this garden city so that they could walk to work – which is cheaper for their employers – and so that they did not cross through the white areas, in an era of segregation. That this placed them in the path of pollution from the factories was thus a consequence of a complex of intentions, but all underlain by an understanding of black workers as "disposable others" (Magubane, 2007).

The transformation of Steel Valley from a polluted community to a "conservation landscape" can also be described in the same terms. ISCOR/Mittal's transformation of Steel Valley from a neighbouring community to a park-like buffer zone provides an example of the migration of a technique of discipline: the conservation destruction of existing human habitation of areas turned into "wilderness". Such transformations of the landscape are not uncommon in South Africa. It was very visible in the formation of the Kruger National Park, under its first chief warden, Col James Stevenson-Hamilton, whose Shangaan nickname was Skukuza, "the broom that sweeps clean". Stevenson-Hamilton found the park "sprinkled with kraals, the inhabitants of which were mostly natives of Mozambique, who lived on the game which they snared and slaughtered at will" (Meiring, 1982: 21), and then swept them away to create the game reserve. Kraals, graves, mission stations and other signs of (mostly black) inhabitation have been removed to recreate "wilderness" in the colonial European belief that a pristine African landscape should not contain people (Anderson and Grove, 1989).

In a pollution dispositive, discursive practices would include both the disciplines describing the pollution, and the discourses covering the social management and social responses to its effects. Non-discursive practices would be the production of the pollution

during production processes, which Schnaiberg calls "production science", and those managing its physical effects, which Schnaiberg calls "impact science" (Schnaiberg, 1980). The material manifestations would be the actual pollution and its effects on the landscape and people's bodies. Dispositive analysis will be pursued further in chapter 3.

The authority of science

Dispositives are held together by discursive power, via the knowledges that circulate through its discursive, non-discursive and material practices. For the pollution dispositive, this knowledge is, in the first instance, natural science. Expert scientific knowledges define an important part of the pollution terrain of struggle. The most basic discursive resource in the Steel Valley struggle was the ability to describe – with authority - the pollution as real, to point out the origin of the pollution, as well as the effects or impacts of the pollution.

The fact that pollution, generally defined as the introduction of harmful substances into the environment (Holdgate, 1979), is mostly not immediately observable, is a fundamental characteristic of the industrial risk society (Beck, 1992). In societies suffused by the risk of industrial pollution, the role of the expert becomes crucial. It is a hegemonic expectation – part of the legitimacy of those in charge of an industrial society - that experts can and do manage the risk that pollution poses to people's health, environments and property (Weale, 1992). This expectation applies to the risk creators (that is, the production and environmental managers in polluting industries), the state (in its double role as regulator and broader societal rule maker), and the experts themselves, as professionals in peer-regulated structures. Experts themselves elicit the trust of the public in their roles, through their behaviour and self-portrayal.

Natural science – to many, science 'proper' – is the primary discourse in which pollution is constructed with authority for environmental management by courts, government officials and, to a large extent, the community (O'Riordan, 1995). But this is only part of

its authority, according to McGinn, who claims that science – meaning natural science – "has become recognized as the leading source of cognitive authority in Western life" (1991:6). He illustrates this with the observation that nowadays even mainstream religion either fits into the constraints of a scientific worldview (accommodating evolution) or appeals to science (in debates about abortion) and concludes that science is now more powerful than religion.

Nandy, in his 1988 essay *Science as a reason of state*, describes science as a powerful source of legitimation for the modern nation state. Fischer (1990) in *Technocracy and the Politics of Expertise* draws attention to "the ways in which expert knowledge and technocratic practices have become key political resources sustaining increasingly undemocratic forms of decision making" (1990: 14).

In 1992, the *Agenda for the 21st Century*, adopted at the Earth Summit in Rio de Janeiro, affirmed the important role of science in managing the planet: Chapter 35, "Science for sustainable development", prescribes a role for the sciences:

> "to provide information to better enable formulation and selection of environment and development policies in the decision-making process. … A first step towards improving the scientific basis for these strategies is a better understanding of land, oceans, atmosphere and their interlocking water, nutrient and biogeochemical cycles and energy flows which all form part of the Earth system. This is essential if a more accurate estimate is to be provided of the carrying capacity of the planet Earth and of its resilience under the many stresses placed upon it by human activities" (United Nations, 1993: 257)

As this quotation shows, the scope of science encompasses the whole planet and everything on it. The field of biogeochemistry offers clear examples of the explanatory power and authority of the science at the core of this explanatory power: chemistry. It is strikingly broad in scope and confident in its findings. Chemistry prides itself on being "the central science" – the title of a textbook introducing chemistry to students. Textbooks are useful sources for the analysis of discursive power, because they are aimed at transmitting the central entities and rules of expression in a discipline to new members

of the knowledge community (Berkenkotter, 1991; Kuhn, 1963). Textbooks typically focus, for the benefit of new practitioners, on what the basics of the discipline are, as in this introduction from *Chemistry, The Central Science* (Brown, Lemay and Bursten, 2003):

> "By studying chemistry, you will learn to use the powerful language and ideas that have evolved to describe and enhance our understanding of matter. The language of chemistry is a universal scientific language that is widely used in other disciplines… (to create) an understanding of the behaviour of atoms and molecules provides powerful insights in other areas of modern science, technology and engineering…
>
> "Chemistry involves studying the properties and behaviour of matter. Matter is the physical material or the universe… This book, your body, the clothes you are wearing and the air you are breathing are all samples of matter…
>
> "Countless experiments have shown that the tremendous variety of matter in our world is due to combinations of only about 100 very basic … substances called elements… Each element is composed of a unique kind of atom… the properties of matter relate not only to the kinds of atoms it contains, but also to the arrangements of these atoms…
>
> "Every change in the observable world – from boiling water to the changes that occur as our bodies combat invading viruses – has its basis in the unobservable world of atoms and molecules…." (Brown *et al*, 2003:3)

Another example is the textbook *Environmental Chemistry* (Moore and Moore, 1976). The layout of the text illustrates the dazzling scope of the knowledge contained in it. Within the first 50 pages or so, the text describes the origins of the elements (nucleosynthesis), then the development of the Solid Earth, and then chemical evolution and the origin of life. From this basis, it tackles the issues of energy (including fossil fuels), air (including air pollution), the earth and its mineral resources, soils and waste, and water. This layout is no exception either, as William H. Schlesinger's Biogeochemistry. *An analysis of global change* (1991) follows a similar trajectory, presenting an understanding of conditions before our planet existed, to how the planet

functions now. Chemistry thus holds explanatory powers that constitute an overarching framework for explaining not only pollution, but also the origin of the planet, and the origin of life itself.

Chemistry – or in its broad form, natural science – also provides the tools for the scientific core of environmental management. As the focus moves in more closely on the role of science in pollution struggles, the picture becomes more complicated. It is exactly these complications that are useful to combatants in pollution contests.

Medicine and Pollution

While the fate of pollutants in the environment may be subject to "objective" analysis, the stakes rise when humans are affected by pollutants. Medicine not only has measurement and description as its focus, but also an immediate ethical dimension in the duty of care. The effects of pollutants on people's bodies are studied by toxicology. A great deal of knowledge in this field derives from experiences in the general field of occupational health, which has built up an intimate knowledge of the effects of specific chemicals and other stresses in the production process or work environment, on the bodies of people over time (see for example, *Hamilton and Hardy's Industrial Toxicology,* 1983).

In the practice of medicine, doctors have a duty of care because of the Hippocratic Oath. For some doctors, this implies an active duty of care, for example Jeanette Sherman, who dedicates her classic *Chemical Exposure and Disease* (1988), to "the vast numbers of workers who laboured under the false impression that they were being protected against chemicals in their environment that would ultimately ruin their lungs, hearts, kidneys, and livers, resulting in untold misery and early death". She argues (1988: 8):

> "If a physician failed to investigate a drug reaction (such as asthma or a rash caused by penicillin) and allowed a patient to be re-exposed, he or she could be held liable for failure to diagnose. It is not unreasonable to extend this duty to the investigation and

> diagnosis of chemically caused diseases, to preventing disease in a person or population where there is a known likelihood of exposure to toxic chemicals with resultant harm."

However, most practicing doctors, as was anecdotally established in fieldwork in Steel Valley, did not follow this route, even when they told patients that exposure to steel making pollution was the cause of their illnesses (Cock and Munnik, 2006). From a discursive point of view, the explanation is that most general practitioners view illness caused by the environment as part of the random or "idiopathic" causation of illness. This is applied (Sherman, 1988:5), to illness of unknown cause, but the Greek etymology reveals its true meaning: "one's own suffering", which fits into the individualisation of modern medicine which routinely ignores environmental causation.

In addition, a number of difficulties arise in acquiring and presenting persuasive medical evidence of the impact of pollution on people, as the Steel Valley case (High Court of SA, 2001), showed. A heavy metal like cadmium may pass through the body, causing bleeding in the urine, and leaving behind damage to the kidney. But how does one prove this in court, given that the kidney is still functioning in a living body, and the bleeding has stopped? (Murray Coombs, personal communication, 2006). Cadmium was also the object of argument when it was disputed whether the cadmium in pollution victims' blood was from the steel mill, or from exhaust fumes off a nearby national road (High Court of SA, 2001).

Medical knowledge is limited because of the way that the knowledge of toxicology is built up. Ethical rules do not allow experimentation on people to build up toxicological knowledge. Except in a few scandalous examples, such as Nazi experiments on their captives, and US experiments on imprisoned humans, the majority of toxicological knowledge comes from accidents and sicknesses. In "environmental pathology", therefore, there are big gaps in knowledge. In his textbook on environmental pathology, Mottet, for example, declares:

> "the state of knowledge about environmental pathology varies considerably from one organ system to another. The disease processes caused by environmental chemicals in the

> respiratory, urinary and nervous systems have been much more extensively studied than those of the immune and gastrointestinal systems. I was unable to justify chapters on the endocrine and musculoskeletal systems and pancreas because of similar limitations." (Mottet, 1985: viii).

Epidemiology, which studies the patterns of disease within populations, combines the knowledge fields of medicine and demography. Devra Davis, who grew up in the steelmaking town of Donora, Pennsylvania, which became the site of dramatic pollution smog in October 1948, lost many family members to cancer, which infused her practice of epidemiology with a sense of urgency because of her personal experiences. She appears frustrated at the limitations of epidemiological knowledge:

> "The work of environmental epidemiology remains a blunt instrument. We cannot say that any one person's disease was caused by this particular exposure to this particular chemical on this particular day. The best we can say with any certainty is that if a particular chemical or group of chemicals were not in the environment, some number out of every hundred people who got sick would have remained healthy, and some number of people who died might still be alive. Is this enough? Will this style of reasoning persuade a federal court to make powerful corporations pay damages to sick plaintiffs or to their survivors? Can such an attenuated view of causation provoke anyone's righteous anger?" (2002, p. xvii).

Conclusion: discursive power

This chapter has laid out a theoretical understanding of discursive power. First, it was argued that pollution is a socially constructed understanding of physical events that are not directly accessible, since they are accessible through signs only. Social constructionism focuses on competing constructions of reality, paying attention to claims making which are essentially arguments about how society should address social problems, including environmental challenges. Social construction of reality is a discursive activity. Critical Discourse Analysis investigates how discursive power is generated and used. It is critical in the sense that it opposes the imposition of power and in its analyses, works to reveal the workings of ideological power. In this endeavour, it

reveals the discursive resources which allow the powerful to impose their own framing of issues and options for action, for example having the right to speak with authority on a topic, and expressing opinions that carry the weight of expertise.

The social construction of pollution relies on the availability of previously existing discursive resources, which are created through a heterogeneity of means: academic discourses that create and maintain the concepts for describing pollution, institutions that train individuals in their use and certify them as experts, and the institutions that employ such experts in production and regulation. Together these establish the power of an accepted way of doing things, and with that an accepted level of pollution and ways of managing pollution, and thus also allowing pollution, within certain boundaries.

Discursive resources are deployed in previously constructed arenas that make up the framework of decision making in a modern society: law (the courts), government, public opinion, especially the media. Each of the arenas has different rules for the use of discursive power, including importantly who has authority to speak and be taken seriously. Taken together, these arenas constitute a terrain of struggle about the existence and consequences of pollution**.** Throughout, discursive power and material power are intertwined, although distinguishable. Discursive power "flows" into reality and shapes it – as the concept of materialization expresses it. The dispositive acknowledges and investigates the intertwining of material and discursive power.

This chapter explained the authority of science, with the science of chemistry as example. Medical science, in contrast, illustrates how limited knowledge of toxicology can be. The chapter overall has explained why constructing convincing evidence of pollution impacts is challenging. Impacts from the source, through the environment to the unit of impact have to be traced and proven in an unbroken sequence.

The theoretical exposition has created a basis for investigating discursive power in its relationship to material power, and especially how these powers interact in a situation of pollution. How this is to be done – the methodology – is the topic of the next chapter.

Chapter 3: Methodology

Introduction: a case study of discursive power

The objective of this chapter is to specify and explain the methodology of this work. The methodology derives from the theory in the previous chapter, and answers to the demands of this specific case study, which are to:

1. describe and explain the outcome of the struggle around the existence of pollution and decision making about its consequences,
2. understand the role that discursive power played in these struggles,
3. describe a pollution complex or pollution dispositive at work in Steel Valley, and
4. describe a discursive terrain of struggle for Environmental Justice activists.

The methodology consists of four complementary approaches:

1. A historical description of the pollution in the period 1961 to 1994, thus preceding the case study. This description is embedded in a larger framework of the Minerals Energy Complex (MEC) since the last quarter of the 19th century;
2. A detailed analysis of the deployment of discursive resources in a number of crucial arenas in the strategies of the main players in the struggle about continuing pollution after the discursive changes of 1994 (see appendix 1);
3. An analysis of the pollution dispositive from the materials generated in the first two descriptions;
4. An analysis of the implications of this case study for Environmental Justice activism.

In this chapter, the case study approach as outlined by Yin (1989) is taken as a point of departure, and the case study is set against Yin's requirements. Then the question of the

author's participant observation and embeddedness in the South African Environmental Justice movement is taken up. The study is then placed within the existing literature on Vaal Triangle and its pollution. Next, attention turns to the sources of evidence, their status, how they were contested, and the ethics of using or not using them in this work.

The content of the case study – a series of 31 discursive encounters – is presented in overview. A more detailed appendix (appendix 1) provides a means for the reader to keep track of a history of sometimes confusing encounters. The chapter also defines the meaning of a number of crucial terms such as discursive resources, arenas and contests. The most important of these encounters will be analysed (in chapters 6 to 9) in terms of discursive resources, arenas and strategies while focusing on the two central questions about the pollution and its consequences.

Attention then turns to the methods and examples of dispositive descriptions, focusing on Foucault's classic work, *Discipline and Punish* (1982), and Ashforth's analysis of the creation of a dispositive of knowledge and practice of migrant labour, a central dynamic in the political economy of South Africa and its Minerals Energy Complex (MEC), (Fine and Rustomjee, 1990). This exploration is doubly useful, as it is further pursued in the next chapter where the Steel Valley case study is placed in the context of the history of the Vaal Triangle, which, as South Africa's industrial heartland, is a prominent part of the MEC.

Case study approach

A case study is "an empirical enquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between the phenomenon and context are not clearly evident, and in which multiple sources of evidence are used" according to Yin (1989: 23). Yin expects a case study to construct an explanation of the events in the case study, produce generalizable theoretical propositions and develop ideas for further study. This section deals with Yin's requirements for a case study, and considers how this case study meets them.

The Steel Valley case study is contemporary, although its roots reach back into the past. The author participated in participant observation for the past seven years. The case remained dynamic in a real-life context, as ongoing media attention and interaction with participants can testify. The boundaries between the immediate events, the struggle about the existence of the pollution in Steel Valley and its consequences, are also not easy to separate from the context of a South African political transition, a worldwide transition to sustainable development and environmental management, and its place in the growth of the Environmental Justice movement.

This study is built on a variety of types of evidence, some archival, some gained through desk top research, some through interviews, and some through participant observation. Further, the evidence itself plays a prominent role, both because of the role discursive power played in the events of the case study itself, and because of the methodological choice to focus on discursive power. As a result, the nature of the evidence is of interest to the study, and attempts are made throughout to specify where the evidence comes from. As a study of discursive power, it is also an investigation of what purposes the different types of evidence serve, and how.

The expected strength of constructing an explanation in a case study (Yin, 1989) is that it generates insights. In this case, it explains a puzzling occurrence, namely why something which seemed unlikely to an important section of the participants, namely the residents of Steel Valley and many activists – that the pollution could be denied and have limited consequences for the polluter – was in fact an outcome. This is explained by looking at discursive power play and ultimately the power configurations enabling discursive power. Yin (1989) also remarks that case studies may be reported in narrative form, as this one is, namely as a quest for Environmental Justice by the affected community of Steel Valley and its allies.

The study's findings are generalizable to theoretical propositions, and for this purpose it engages a theoretical terrain in the manner of grounded theory (see Babbie and Mouton,

2001) drawn from disciplines engaging public opinion, the state, regulator and polluter behaviour, as well as the developing, theoretically engaged, practice of Environmental Justice activists, within a broader perspective on the nature and use of discursive power and discourse analysis, as laid out in chapter 2. Its generalizable findings are related back to the motivation for the participant observation: the Environmental Justice project of the Steel Valley residents, which became a conscious EJ project while it was proceeding, as well as other cases of contestation about pollution between fenceline communities and aspects of the Minerals Energy Complex in South Africa. These aspects are discussed in chapter 10.

Case studies are expected to build theory, which is achieved here. It extends Critical Discourse Analysis by blending it with dispositive analysis within a framework of the social construction of reality. It builds EJ theory by linking mechanisms of environmental injustice specified in EJ theory, to accumulation and legitimacy processes, and their effects in the public sphere. By presenting a real life case study, it enriches EJ theory building which is based on reflecting on practice. It enriches the theory of participatory democracy by contributing a case study of a struggle over the constitutional right to a healthy environment, in a country in transition to a newly rights based, participatory democracy. These aspects are further explored in chapter 10.

Yin also remarks that a case study should develop ideas for further study. These ideas are laid out in the conclusion, chapter 10, as a result of this study. The present study is also offered as an early overview study of the extensive body of evidence in the Steel Valley case, while acknowledging that a complete overview is not feasible within the scope of this work. It carries the intention of opening and defining a field of research, suggesting tools for doing it via discursive analysis. As a result, it invites more detailed further studies.

Critical approach and participatory observation

What is a critical approach? According to Fairclough,

> "Critical social research (including Critical Discourse Analysis) aims to contribute to addressing the social 'wrongs' of the day (in a broad sense – injustice, inequality, lack of freedom, etc.) by analysing their sources and causes, resistance to them and possibilities of overcoming them… On the one hand, it analyses and seeks to… explain how semiosis (meaning making) figures in the establishment, reproduction and change of unequal power relations (dominations, marginalization, exclusion…) … On the other hand, critique is oriented to analysing and explaining… the many ways in which the dominant logic and dynamic are tested, challenged and disrupted by people, and to identifying possibilities which these suggest for overcoming obstacles to addressing 'wrongs' and improving wellbeing" (Fairclough, 2009: 163).

The epistemological and value commitments of discursive analysis and the critical approach, based on the work of the Frankfurt School (Arato and Gebhardt, 1978), also encourage transparency of sources, and of how the knowledge contribution was constructed. Critical discursive analysts should be clear that their own texts are constructed, and contain a value orientation, a politics, and a desire. This text does as well. The constructed nature of knowledge has been extensively argued in the previous chapter. Equally, analyses are discursively constructed, evidence is chosen from a continuum of events, some evidence is not known or not in view. All knowledge is limited, because there is too much to know; it is embodied, because it is now known by an individual constrained (and enabled) by a biography; and it is localized in space (Rose, 1997).

This is also the case here. This researcher first became more than casually aware of the Steel Valley issue in 2002, while working as a policy analyst for the civil society

secretariat of the World Summit on Sustainable Development (WSSD). I attended the groundwork corporate accountability workshop and the Corpse awards in 2002, which were activist critiques of global corporate pollution. I joined the Friends of Steel Valley and facilitated the founding meeting of VEJA in (January 2005). I also attended strategy meetings and served on the steering committee of VEJA for four years. This included monthly attendance at meetings as well as workshops to build capacity on water quality, air quality and waste issues. I undertook a study into this area together with one of my supervisors, Prof Jacklyn Cock in 2005, including a survey of organizations involved in VEJA (Cock and Munnik, 2006).

I then researched the groundWork Report 2006 on VEJA and the Vaal Triangle, as a co-author, and included VEJA members in our research party on solid waste issues in the groundWork Report 2008 (Hallowes and Munnik, 2006; 2008). There have thus been various and ongoing interactions, and these have resulted in a familiarity with the study area. Such familiarity can also reasonably be expected to lead to identification with the residents of Steel Valley, and to some extent adopt their perspectives on the other protagonists in this case. These exposures can all be described as participant observation (Babbie and Mouton, 2001). Participant observation does impart a strong perspective to this work, leading me to take, as a point of departure for the narrative, the polluted community's efforts to realise the right to a healthy environment promised to them in the 1996 constitution in the new South Africa, as well as an emphasis on discursive practices within the EJ framework. This work is inspired by observing how the community's sensible and persuasive experience and discursive construction of being polluted, was frustrated by the discursive and other strategies of other protagonists. This provided the impetus to explore such discursive strategies and the discursive resources that enable them.

As a result, the underlying narrative of this study is that of a quest by a polluted community attempting to realise its rights to a healthy environment to deal with an immediate pollution situation. This attempt is frustrated by encountering a series of obstacles in the form of the authority and uncertainty of science, the state's balancing act

between legitimacy and accumulation, and the practice of limited liability as well as the hegemony of the growth discourse, to find, in the exercise of discursive power, answers to the community's questions: "how could anybody deny the existence of the pollution and get away with it?" And "why did Steel Valley experience the constitutional promise of a healthy environment to be hollow?" The promise of a constitutional right to a healthy environment is discursive, and so is its denial.

The thesis therefore does not claim to be neutral or apolitical, which is inconsistent with both critical thinking and political ecology (Robbins, 2004). It adopts the community's perspective and intentions, while attempting to describe the operational environment for the fenceline communities as accurately as possible. It is objective in this sense only. A lack of objectivity in this description would do a disservice to fellow environmental activists, because objectivity is strategic to understanding the tactical terrain on which Environmental Justice activists engage.

Is this thesis justified in describing the pollution of Steel Valley as real? There are many ways of answering this question. It would be difficult to understand why so many people and institutions have become involved in this issue, and why ISCOR settled out of court in a number of cases, if the pollution was not real. But there is in addition a question of scientific proof.

As will be discussed below this thesis will argue that (1) there is an extensive body of knowledge of the pollution that was created over more than 50 years, and has become open to public scrutiny since 1997. At the same time, the thesis also argues (2) that there are a range of reasons why this knowledge did not lead to the consequences that the residents of Steel Valley expected in terms of their understanding of their constitutional right to live in an environment that is not harmful to their health and wellbeing. The first question will be pursued in chapter 5, which deals with the extent of the pollution. It is the work of the rest of the thesis to provide an answer to the second question - namely that the use of discursive power, in a power constellation that can be described as a pollution dispositive, provides an explanation.

Nature of the evidence

This section introduces the "body of evidence" on which the thesis basis its analysis, and points to the variety of voices and sources of evidence. It emphasizes and explains some characteristics of this body of evidence: that it is overwhelming in scope, that it is partly hidden, but that great parts came into public view due to the contestation, and that it is in fact contested, with serious consequences for the winners and losers of these contestations.

The first section provides an overview of published literature on the Vaal Triangle, and industrial pollution studies in South Africa. However, most of the evidence comes from so-called grey literature, from a variety of sources. These are discussed in order to indicate their origin, and to draw attention to the process of how, in the new South Africa and specifically in the Steel Valley pollution struggle, previously confidential information came into the public domain. It is also important to discuss the ethics and implications of using – or not using – information that became available in this way.

Historical evidence: The Vaal Triangle and industrial pollution studies in South Africa

For its historical background, this thesis drew on the relatively small literature on industrial pollution in South Africa and community responses to it, as well as a historical literature devoted to the Vaal Triangle.

The most sustained attention to industrial pollution in South Africa can be found in the groundWork Reports (2002, 2003, 2004, 2005, 2006, 2007, 2008), centring on pollution, corporate accountability and energy policy, and written from the perspective of Environmental Justice. Bond's *Unsustainable South Africa* (2002) contains a section on the Vanderbijlpark pollution, as does Cock's *The War Against Ourselves* (2007). The study *Poisoned Spaces: Manufacturing wealth, producing poverty* (Hallowes and

Munnik, 2006) centres on "the making of environmental in justice in the Vaal Triangle" (2006; 9) and presents a pollution history of the area from the 1880s to today.

An international literature on the experiences and responses of polluted communities (Davis, 2002; Levine, 1982) as well as corporate and government behaviour (Bakan, 2004; Doyle, 2004; Kovel, 2002: Punch, 1996; Brown and Mikkelsen, 1992) informs this study by comparison. Specific works deal with the legitimacy of government and its role in a risk society (Beck, 1992; Weale, 1992; Jessop, 1990; Offe, 1984; Yudelman, 1984). These works will be discussed in the chapters where they are used.

There is also a growing "grey" literature on fenceline community experiences which is actively exchanged between polluted communities and activists working with them, which was discussed in chapter 1 under Environmental Justice, but also contains specific reports referred to later in this work.

The pollution aspect of the Vanderbijlpark Steel Works has not been a sustained focus in academic literature. However, Prof Johann Tempelhoff's *The Substance of Ubiquity. A History of Rand Water 1903-2003* (2003) provides insights into the fluctuating nature of industry awareness of pollution effects among water professionals. A description and analysis of Steel Valley events can also be followed in Tempelhoff and Tempelhoff, (2006), which is the result of collaboration between a historian and an environmental journalist who have followed pollution struggles in Steel Valley in in the Vaal Triangle over many years. Journalists have consistently covered the Steel Valley history.

There is a body of specialist, technical literature (mostly commissioned by the Water Research Commission and available on www.wrc.org.za) on water pollution in the Upper Vaal, covering especially salinity and monitoring of water quality. They concentrate on the effect of the gold and coal mines in the catchment and do not describe or specify ISCOR's pollution. It is notable that water for Rand Water consumption (10 million people in greater Gauteng) comes from other catchments, including Lesotho, and is

withdrawn before the impacts of ISCOR, SASOL, other Vaal industries and the gold mines from the Rand are felt (Cooks, 2004).

There is an interesting literature in the discipline of "regional history" developed by the Unit for the history of Industrialisation and the Vaal Triangle, practised at the Vaal Campus of the University of the Northwest (previously the University of Potchefstroom) under the leadership of Prof PJJ Prinsloo (Prinsloo 1994; 1993; 1992) which includes his 1993 history of the Vanderbijlpark Steel Works. This focuses on the direct history of the steel works, including its various phases of expansion, immigration into the area, town planning, local government etc. It gives scant attention to any environmental impacts.

The bulk of academic literature focuses on the steel works as part of the history of parastatals, with particular attention to labour regimes and market and production conditions (Clark, 1994), or as a topic in industrial policy (Roberts, 2004; Fine and Rustomjee, 1996). It deals with the growth of the steel industry and its effects on downstream growth, privatisation in the later 1980s, and the fortunes of Mittal Steel at present. Mittal as an international figure has attracted the attention of researchers (e.g. Reutter, 2005) as well as considerable press coverage in business pages.

Labour matters at ISCOR Vanderbijlpark have received attention from researchers such as Hlatswayo (2004), who had to use PAIA (Public Access to Information Act) to access information, by Loebell (2005), in which workers' experiences in ISCOR are documented in their own words, and an unpublished essay by Dinga Sikwebu prepared for the UKZN study mentioned above (Sikwebu, 2005). General work on the steel industry in South Africa is represented by Karl von Holdt's *Transition from Below* (2003).

The Vaal Triangle has played an important role in South African political history, expressed best by the Sharpeville Massacre of 1961 (Frankel, 2001) and Vaal Uprising of 1984, but going far beyond it. A semi-biographical account of the Vaal Uprisings was done by Father Patrick Noonan (2003). The same events were treated to academic

analysis by John Saul (1986). Early history (going back to semi-independent black farming on the Vereeniging Estates at the turn of the century) is covered in Trapido (1986).

ISCOR itself has published a number of histories, and the early *Steel in South Africa 1928-1953* (not dated) is especially interesting for the heroic manner in which it portrays the founder, Van der Bijl, who was also founder of the Industrial Development Corporation (IDC) and Eskom. This history is covered from an analytical perspective in the work of Nancy Clark *Manufacturing Apartheid* (1994).

The ISCOR and Vaal Triangle pollution experiences can be read in a broader South African environmental literature that has developed since the late 1980s in tandem with Environmental Justice activism that distinguished itself sharply from an earlier conservation focus focused on wilderness areas from which people and their concerns were purposely absent. The landmarks in this literature include Koch and Cock's *Going Green* (1991), Ramphele's *Restoring the Land* (1991) and James Clarke's *Back to Earth* 1991). These all sketched the legacy of environmental neglect and degradation resulting from apartheid.

Going Green demonstrated that the environmental challenges "facing South Africa are deeply political… the crisis is embedded in people's lack of access to power and resources, and cannot be resolved until these underlying causes are addressed". It also saw the environment not as "confined to preserving wilderness areas of endangered species"… "The environment is where people live and work, so the major concern of a new environmental policy must be to ensure that all South Africans can live in health and safety" (back cover, 1991). Similarly *Restoring the land* stated in the foreword: "As (South Africa) debates its political and economic future, the environment is emerging as a central issue. Apartheid policies not only discriminated racially – they directly contributed to some of the worst examples of environmental degradation and pollution in the world" (1991: vii)

Collections of evidence

There is a great bulk of evidence in this case, covering a period more than 50 years since the start of operations at the steel factory. Many of the texts that inform this study are from "grey literature", that is sources that have not been published. They represent moments in the pollution struggle, or as will be described below, evidence of discursive contestation. What follows here is an overview of both these texts and background information gathered for and used in this study. Much of this information has come to light or indeed been created specifically as a result of the Steel Valley struggle.

The documentary evidence of this pollution is spread out in many places, and has come to light as a result of specific interventions. This includes a government (Department of Water Affairs and Forestry) collection of documents that came to light first in a public forum (the Iscor Pollution Forum, 1997) and then in a court case (the Johnny Horne court case, in 1998), a whistle blower revealing information from inside the steel factory's environmental management unit (Van Eeden, interview 2005), and evidence of health and livelihood impacts, as well as further documents gathered for two court cases (High Court of South Africa, Case no 00420/01, which carried on into 2003, and another case prepared as an appeal against the dismissal of the Case no 00420/01; personal communication Margie Victor, October 2012). This information was used in an overview article by Prof Philip Lloyd in *African Wildlife* (2003).

The archive contains various examples of the use of discursive power: DWAF letters – both internal and for outside consumption, correspondence between all of the players that were received and kept by DWAF. It also contains consultants' reports (here summarised as the evidence that was used in the 16 applicants' court case), and can be found in the Consolidated Heads of Argument, Vol 3 of CASE NO 00420/01 (High Court of South Africa, Case no 00420/01, 2001). There are also medical reports from research undertaken for the 16 applicants' court case (High Court of South Africa, Case no

00420/01, 2001). Media reports were noted in the DWAF archive, and internal correspondence within the department on how to position the department's answers.

The Friends of Steel Valley (FOSV, an association of volunteer resource persons supporting the Steel Valley struggle) have assembled materials on the area, including detailed maps, interviews with Steel Valley residents, names and addresses of people involved, technical analyses of the nature and processes of pollution, and a basic history of the struggle against ISCOR. Most of the photographs used in this thesis originate from FOSV field visits, especially by two core members, Stefan and Erika Cramer.

A short history of an earlier court case, the so called Johnny Horne case, has been documented by their advocate, Duard Barnard (Barnard, 2002). The cost-benefit analysis conducted for the ISCOR/community forum (L&W Environmental, 1998) is a rich source of information about the community at the time. For ease of reference, these documents are referred to separately in the bibliography, but are listed in the bibliography under a separate section.

A number of Environmental Impact Assessments (EIAs) commissioned by ISCOR provide interesting information about processes and their environmental impacts. The EIAs point to pollution that has happened up to now. As the process of steel making is standardised and well known, it was possible to research this on various websites and compare it to an *Industrial Pollution Control Handbook* (Lund, 1971) which reflects the international state of knowledge regarding pollution from steel production in the late 1960s.

Air pollution in the Vaal Triangle is covered in a ground-breaking report by Yvonne Scorgie (2004), a desk top study of existing (but scattered, unverified and likely underreported) information in which 70% of the most important sources of air pollution are quantified in terms of health costs. This information is more likely to understate than overstate the extent of the pollution (Hallowes and Munnik, 2006). This information was later accepted by the state as evidence of serious air pollution (Lukey interview 2006). In

this report, the Vanderbijlpark steel works is described as one of the top four offenders in the Vaal Triangle in terms of air pollution. Health effects from steel pollution are also well known (especially inside the workplace) as the textbook *Industrial Toxicology* of Hamilton and Hardy (1984) attest to. Local Steel Valley resident Jaap van Rensburg has produced a "cancer map" (Cock and Munnik, 2006) and documents detailing his experiences.

Background information on steel making and pollution from it is freely available from generally accessible sources, and is also quite old. A pollution textbook (Lund, 1971) for example, dates from the same time as ISCOR and DWAF special committee (see below) would be making its decisions about its operations. These examples suggest that it was not likely that the information and awareness of the chemical physical pollution processes (first order pollution information) that was missing, but that there could have been other factors that influenced pollution decisions.

Steel Valley residents, who had been participants in this struggle, were very open to interviews and repeated follow ups, volunteered information and encouraged the author in his work (De Cock, personal communication 2011). A number of formal interviews and informal interactions were undertaken over a number of years with people involved in this issue. Some of the information was given off the record or without attribution, some of it was revealed in informal settings. These interviews included, for example, community members such as Joey Cock and family, Jaap van Rensburg, Neville Felix, Danie Lingenfelder, Johan de Kock, Samson Mokoena, Rachel Ramodibe, legal team Maggie Victor, Raymond Appel, and Phineas Malapela.

The perspective of EJ was incorporated into the events, both in the embedding of an EJ framework in the VEJA constitution, and as an activist perspective, and so was the practical framework for the participant observation. Research for the groundWork Report *Poisoned Spaces* (Hallowes and Munnik, 2006) allowed for access to a range of people involved, also in the broader Vaal Triangle.

As VEJA became part of an international solidarity movement, international, comparative evidence became available, e.g. Ohio *Smoke and Mirrors* report (Ilg, 2003), and the international report *In the wake of ArcelorMittal: The global steel giant's local impacts* (Aitken, 2008) and *ArcelorMittal: Going nowhere slowly. A review of the global steel giant's environmental and social impacts in 2008-2009* (Aitken, 2009). Nationally, the VEJA activists gained access to and participated in processes of information exchange through workshops with its older role model, South Durban Community Environmental Alliance (SDCEA) and other actors in the Environmental Justice movement, and participated in the production and distribution of the 2006 groundWork report, *Poisoned Spaces*. A report of the Centre for the Study of Civil Society (Munnik and Cock, 2006) also did participatory research into the affiliates to enable VEJA to gain research experience and do an analysis of their own constituents.

This work also draws on lively journalistic coverage of environmental injustice, also evident in the Steel Valley case.

Difficulties in accessing information

In some cases, it was difficult to access information. In particular, despite friendly personal contacts, there was extreme difficulty of accessing information from ISCOR, now ArcelorMittal. ArcelorMittal has been involved, as this thesis will discuss below, in a number of court cases, public forums and media confrontations where it has been accused of pollution.

For this case study, I was accorded one "off the record" interview, where I took no notes, but at least gained some insight into corporate staff attitudes. I was present at an NGO encounter with ArcelorMittal in the Luxembourg and Vanderbijlpark boardrooms. An official request for an interview with current ISCOR managers and environmental managers was turned down.

The whistle blower, Dr Pieter van Eeden, an ex-employee of ISCOR, specified that he had placed pollution evidence in the public domain in conformance with the provision of the National Environmental Management Act, which provides for whistle blowing (Van Eeden, personal communication, 2011). The most important piece of evidence here is the "Master Plan Integration Report" (Ockie Fourie Toxicologists, 2003), a copy of which was given to me by whistle blower Dr van Eeden, as well as an Executive Report: Environmental Master Plan (ISCOR, July 2003), which was publically distributed and reported on in the media. It can also be argued that during the 2003 public consultation process on a water use licence, the Master Plan itself, including the Master Plan Integration Report, had been placed within the public domain. But since readers were then not allowed to remove it or make copies of it, should it be understood that the Master Plan had been placed "temporarily" in the public domain and then withdrawn again, or that it was "partially" in the public domain and partially not? An additional question is whether these restrictions in a public participation process had themselves been legal? The author would encourage a study of this aspect to be undertaken by other scholars.

A serious consideration remains the ethics and academic rigour in working with this corporate information. This case study is not alone in facing that question. Corporations are generally reluctant to allow researchers access to their staff on these topics (Punch, 1996), since it constitutes a risk of exposing "corporate deviance" of which pollution is one aspect. According to Punch:

> "…just about everyone working in the area of corporate deviance bemoans the fact that very little research is conducted on this subject. That work which is done tends to be carried out by sociologists, legal scholars and criminologists (and especially by some tenacious and well-informed journalists)" (1996: 40).

Punch notes that business schools in general do not encourage this type of research or reflection. Businesses themselves are generally secretive. One researcher, for example, was refused permission for his study by thirty six corporations before he found a willing

subject. Punch concludes that corporate deviance may in fact be "institutional regions that are unresearchable by conventional and ethical means. It implies that we are highly reliant on scandals, the media, public inquiries, police investigations, and 'whistle-blowers' for glimpses of the concealed world of top management and particularly its involvement in 'dirty tricks" (1996: 43). It also complicates the work of analysing the role of corporate behaviour in pollution case studies like this one.

In this case, the decision to use the information in the 2003 internal summary of the Master Plan was made on the following grounds:

- It is not clear that the Master Plan is actually not in the public domain, although it is acknowledged that this is a point of contestation
- Whistle-blower activities put this report in the public domain;
- The summary provides authoritative and recent evidence that pollution did take place. Clearly this question is important for the study;
- In a study of a community confronted with confusing and frustrating politics of disappearing and hidden information, it would be self-contradictory to exclude this information.

Analysis of a discursive struggle

Iterative methodology and building an explanation

This research followed an iterative methodology. Much of the participatory research, first as part of the Friends of Steel Valley and then as part of VEJA, was an immersion in the original puzzlement about how the counter-rational outcome – the polluter's denial of the pollution and then escaping liability despite the constitutional right to a healthy environment - was possible. Through continued familiarization with the events and actors, and grounded theory building, the situation was then "rationalised" through explanation, by identifying specific discursive encounters, analysing their elements, which included the outcomes explained as the result of a balance of discursive and material power, as well as tactics and strategy, within the arenas in which they took place,

and according to the rules that framed these struggles. The objective was to explain it from the perspective of Steel Valley residents and activists allied with them.

These insights were not achieved in a stepwise, logical manner. Hence, the presentation in this study portrays a logic that is more of theoretical intent than the actual process of discovery. From participatory observation to theory building, the nature of the task changed. However, from the start of this project the theory building always happened within the framework of an EJ interest in discursive power (see chapter 1). This interest provided the way into the theory building, focusing on the community as the central actors, and taking their perspective: both what really happened and what appears as potentially possible. The theory building was based on the components of the case study: the three main actors (community, polluter, government) and their various discursive encounters. Attention was also paid to a fourth, crucially important set of actors – scientific experts – to take account of the important role of expertise in discursive encounters, and as an illustration of a powerful discourse (science as a discursive resource). An analysis of the equally important question of legal expertise was left outside the scope of this study, although the author would encourage other scholars to take on such a study.

The explanation was built in a stepwise manner (compare the approaches in Bijker, 1995 and political ecology, Robbins, 2004) from the community experience to more and more encompassing – and fundamental – obstacles to the achievement of Environmental Justice in the final chapter. The analysis compares characteristics of this case, and its explanation, to what is known more broadly about pollution cases. This approach can be described as an analytical strategy:

- I reconstructed a history consisting of turning points (or points at which the discursive forces that are being investigated are on display). These are the 31 points specified in the appendix. This reconstruction is comprehensive and representative.

- I found a consistent pattern of the use of discursive power in each (although the 31 points are selected both because they are discursive and because they make up the history). This pattern can be described as the strategies of the three central role players (protagonists) relying on four overlapping but different sets of resources: community meaning making, scientific authority, public legitimacy and the dominant growth discourse.

The next section provides an introduction to the operational concepts for the analysis of the 31 identified events.

Discursive resources and their use

A core term in this study, "discourse", is widely used in at least three senses including "meaning making as an element of the social process", "the language associated with a particular social field or practice" and "a way of construing aspects of the world associated with a particular social perspective" (Fairclough 2009: 162). All three meanings are relevant to this study. Therefore the following section specifies how specific expressions will be used in this study.

The central analytical concept of discursive power in this study relies on a concept of discursive resources, which is closely allied to the third meaning above and emphasizes the active creation of new and the competitive access to existing discursive resources in order to exercise discursive power. Discursive resources, contained in discourses, make the use of discursive power possible as a result of previous work and through access to these discursive resources. Material power crucially but not completely determines such access.

This study thus has a prime interest in describing the creation and deployment of discursive resources. Its definition of discursive resources therefore accords with the

understanding that a discourse is "an institutionalised way of talking that regulates and reinforces action and thereby exerts power" (Link, 1983: 60 quoted in Jaeger, 2009: 45).

What are discursive resources? Dryzek (1997) articulates a view of discourses as simultaneously perspectives, schools of thought, and treasure houses of concepts that enable action. Norman Fairclough's concept of "members' resources", defines actors as members of a discourse or order of discourse with the ability to produce and interpret discourse interventions, as discussed in the previous chapter. In a contest such as that of Steel Valley, the focus is not on how the individual and social practices are formed in ordinary discourse, but how discourses are available for and used in conflict situations.

The deployment of discursive resources, like any other resources in a conflict, is made possible by access to pre-existing resources, whose conditions of possibility include the existence of institutions, practices, knowledges, languages and conventions, and whose very availability is the result of the historical struggles over the (creation and appropriation of these) resources in a political economy. In Fairclough's analysis this is called the context (Fairclough, 1989).

Discursive resources are deeply entwined in social practices: "Discourses do not exist independently; they are elements of dispositives…" (Jaeger, 2009:56). The next section draws attention to the social spaces, created and maintained through material power, in which discursive resources are deployed.

Discursive arenas

Discursive arenas can be defined as rule bound spaces in which discursive encounters take place. This is closely bound up with the idea of discursive authority – that is, who can speak with authority on a topic. Consider the difference between the arenas of law and of public opinion. In a legal arena there typically are strict rules, for example the requirement to the admitted to the bar after an examination, high expenses in professional

fees, the need for a knowledge of precedent, rules of evidence, and different types of hearings. In contrast, in the arenas of public opinion there is much easier access, including writing letters to the press, dealing directly with journalists and issuing press releases, taking part in radio shows and being televised. Activist arenas for building solidarity, sharing information and planning actions are the result of networking, knowledge, legitimacy with constituencies (affected communities): essentially the determinants of solidarity power.

All arenas or platforms are brought into being and then dissolve, but some may seem relatively long lived, for example newspapers in various forms which date since the start of capitalism and court proceedings which have a long history. Others may be short lived and specially created for a limited time, for example the forums in the early 1990s during the first years of the South African democratic transition, or the WSSD, which followed 10 years after the 1992 Earth Summit. The public sphere is made up of a number of more or less transitory or changeable spaces (Habermas, 1996).

Discursive strategies

Strategies are means of pursuing goals within the realities (constraints and opportunities) of the environment external to the strategic actor. Discursive strategies are based on discursive resources. The strategies consist of decisions and actions to develop, access and deploy discursive resources in available arenas, or sometimes create such arenas or opportunities. Strategies may include attempts to use higher level resources in order to open or close arenas, or affect circulation of knowledge. Strategies always operate within the given constraints and a study of strategies is useful to reveal both opportunities and constraints.

Discursive encounters

The following analysis identifies 31 central discursive events (see Appendix 1). They all fit broadly into the central struggle. While some are direct contestations, others may be

reflections on the struggle by the actors involved, (interviews, diary entries, supporting documentation), or discursive interventions like pamphlets and newsletters. They are all instances of the use of discursive power, and brought together by their intention or use to influence the outcome of contests essentially around the two central questions: the existence of the pollution and what the consequences of the pollution should be.

These discursive interventions were analysed to identify strategies that the thesis ascribes to the actors approached the situation (contests), and what that reveals about the terrain of struggle of pollution issues. Explanations were built up by identifying specific discursive encounters, analysing their elements, which included the outcomes explained as the result of a balance of discursive and material power (including discursive resources), as well as tactics and strategy, within the arenas in which they took place, and according to the rules that framed these struggles.

Encounters involve not only discourse analysis of the sample material above, but also discursive behaviour more broadly – such as power of circulation, of authority to pronounce, of privileged rules of arenas such as science, law and government administration. Special consideration is given to community meaning making (Fairclough, 2009) and public opinion.

In selecting the discursive encounters, the following criteria were taken into account:

1. encounter, issue and participants
2. background history to understand the encounter
3. arena (discursive rules and authoritative discourses)
4. framing and definition of the pollution (e.g. uncertainty, authority of evidence)
5. exercising power over the circulation of information
6. discursive resources (and how they enable tactics and strategies)
7. tactics and strategies of deploying discursive power (patterns)
8. outcomes (immediate issue and longer term consequences)

9. timeframe (date, duration) – also evidence of occurring before or after other events and possibility of influencing them
10. chapter(s) where further analysis takes place.

To illustrate the method of analysis, two samples from the worksheets (to be found in complete form in Appendix 1) are reproduced below. The first is a list and short description of the nature of the discursive events, and the second is a sample of the analysis of the first three of these events.

Fig. 3.1 Discursive events; event and nature of event (full analysis in Appendix 1)

Event or encounter	Nature of discursive encounter(s)
Phase 1: challenging pollution (1994 to 2000)	**In this first phase, from 1994 (the arrival of the new SA) to the start of the buy-out in 2000, the first opening up of the public sphere, new rules for discursive encounters. This new framework for discursive contestation is used by protagonists.**
1. DWAF challenges ISCOR	New constitution empowers officials, DWAF takes up residents' complaints, Carin Bosman correspondence; DWAF decides confrontation in court is not worth it (officials' informal communication - it's a risk for officials to use law, the legal costs as well as cleaning up and then sending a bill)
2. Steel Valley residents consolidate in new local government	New democratic local government, alliance across racial lines, to challenge polluter. Local political mechanism for redressing pollution issue from 1996
3. ISCOR and local government pollution forum	Platform for ongoing discussions between polluter and residents organised (demanded) by local government, access to archives' information
4. Nolte report	Consultant to ISCOR from Council for Scientific and Industrial Research (CSIR) gives certainty about the pollution.
5. DWAF forum (not the same as the first forum constituted by local government)	Constituted by DWAF after local government forum failed
6. DWAF archive goes public	As part of forum proceedings. These are the reports that Carin Bosman read, that prof Philip Lloyd analysed, that Johnny Horne group took into their court case and that the 16 applicants put before the court
7. Cost-benefit analysis	Main product of the DWAF forum was a cost benefit analysis between buy-out and remediation options, favouring buy-out
8. ISCOR buy-out proposal	Proposal before the cost benefit analysis was completed, thus anticipating its outcome. Basis for later buy-out.

9. Calculations for buy-out	Document in which one resident wrote down his considerations about the buy-out. It reveals the impact of the buy-out proposals.
10. Johnny Horne court case	Court case by residents because of frustration with forum
11. DWAF dealing with outcomes of forum	Correspondence between DWAF and ISCOR when DWAF was called upon by Steel Valley residents to manage outcomes and outfall of forum, and make its decisions binding, but failed to do so
12. Unilateral ISCOR buy-out	ISCOR initiates single buyer buy-out of Steel Valley farms. It demarcates its own buy-out zone, at its own prices calculated through its own process
13. ISCOR's Water Use license (Exemption 1998B)	Contains a phased approach for management of ISCOR pollution
Phase 2: Refusing Closure (2000 to present)	**This phase takes place in the aftermath of the buy-out and physical destruction of (most of) Steel Valley. It is characterised by people's memory, organisation locally, regionally, nationally and internationally, and ongoing pressure on ISCOR - now Arcelor-Mittal. Mittal pushes for closure with help from the state**
14. The Master Plan	8000 pages of information on pollution and remediation strategies, kept secret with agreement of the regulator
15. Court case of 16 applicants	16 applicants decided to repeat the success of the Johnny Horne court case, used same and similar evidence, expected same results
16. Scientist whistle blower	ISCOR employee provides information to residents for court case
17. DWAF moves to closure under media spotlight	Media spotlight occasioned by 16 applicants' court case. DWAF legitimates ISCOR's behaviour as it legitimates itself under pressure of media attention.
18. Hatch Report	Due diligence report in which IDC (part ISCOR owner) presents position of closure on pollution battle in order to sell ISCOR
19. Gagging order and SVCC	ISCOR imposes gagging order on 16 applicants which leads to formation of Steel Valley Crisis Committee to speak on their behalf
20. WSSD and toxic tour	During WSSD, Steel Valley issue emerges on national and international civil society corporate accountability agenda. Media and international dignitaries are taken on toxic tour including ISCOR works.
21. 2003 water licence application	Licence contains formal procedure of public participation and comment, reveals community attitudes
22. leaked centralisation memo	Memo leaked by whistle blower showing information control in Master Plan process
23. Friends of Steel Valley	Formation of support organisation for SVCC, brings in expertise on basis of solidarity
24. VEJA founded	Brings together organisations in the Vaal Triangle fighting pollution.
25. Constitutional court challenge	Individual challenge by Johann de Kock, ex-resident of Steel Valley.
26.2006 water use licence	Stronger regulation of ISCOR's water use through license preconditions

27. Mittal R1 billion green budget	Mittal planning for refurbishment, involves a series of EIAs, for slagheap, coke plant, iron reduction plant etc.
28.Opening water treatment plant	This event reframes Mittal's public profile on pollution responsibility. The treatment plant is physical evidence of a new attitude. The brochure produced for opening undertakes the reframing in discursive terms.
29. Day of Remembrance	Organised by VEJA to publicly defend last remaining inhabitants of Steel Valley against pressure from Mittal to move out.
30. Global Action on Arcelor Mittal	VEJA and therefore Steel Valley become part of an international network observing and critiquing Mittal plants
31. Arcelor Mittal meets VEJA	A series of meetings between ArcelorMittal and VEJA

Fig 3.2 Discursive events analysis (events 1 to 3)

Event or encounter	**1. DWAF challenges ISCOR**	**2. Steel Valley residents consolidate in new local government**	**3. ISCOR and local government pollution forum**
Nature of discursive encounter(s)	New constitution empowers officials, DWAF takes up residents' complaints, Carin Bosman correspondence; DWAF decides confrontation in court is not worth it (ex-officials informal explanation: it's a risk for officials to use law, the legal costs as well as cleaning up and then sending a bill)	New democratic local government, alliance across racial lines, to challenge polluter. Political mechanism for redressing pollution issue from 1996	Platform for ongoing discussions between polluter and residents organised (demanded) by local government
Discursive resources	New constitution legitimates discourse of Environmental Justice, human rights, accountability, equality, polluter pays principle, environmental sustainability and responsibility	Local government has discursive authority as political representative, has laboratories, planning staff, can give planning permission	Local government resources, platform with authority and legitimacy embraced by citizens and attended by polluter
Arena and its rules	Official action within job description, bureaucratic hierarchy has discretion, polluter has right to reply and can put pressure on regulator.	Political arena - gives voice to constituents, but must compete nationally with other government priorities - jobs, tax income, economic	Discussion of evidence, representative, new, untested power of democratic local government

	i.e. through lawyers: administrative action, water use permits, exceedances, pollution incidents, regulation. Interaction with public complainants and sometimes media	management	
Strategy and tactics	Cautious regulator, field officials more active than their superiors; polluter continues in tradition of surplus power (rights beyond the law)	Uses political networks, uses own resources, public meetings, engages in forums, develops Mooi Waters Vision, to challenge polluter	ISCOR did not see the forum as binding, forum was replaced by DWAF initiated forum, thus local government authority undermined
Existence of pollution	DWAF official Bosman reads ISCOR archive which contains clear evidence of pollution	Actively seeking evidence of pollution - discusses in DWAF forum. Evidence from residents collected in cost-benefit analysis	DWAF's archive on ISCOR was made available through this forum: consultants reports to ISCOR containing evidence of pollution
Consequences of pollution	Regulator ambivalent about using powers because 1. ISCOR strategic role 2. difficulties of taking action against ISCOR	Actively pursuing compensation, buy-out, medical fund	Sharp disagreement about nature of and responsibility for pollution, ISCOR withdraws into legalistic mode
Material power	ISCOR has huge financial resources to drag out legal battles and win them; ISCOR produces strategic inputs into economy; ISCOR provides many jobs	Provides platforms for citizens to express themselves, plan together etc. material resources including laboratories	ISCOR has huge financial resources, legal team, but forum succeeds in opening discussion and presenting evidence convincing media and public
Comments	ISCOR first seen as alien, Afrikaner ruled entity, but BEE and black appointments change complexion,	Limited as a relatively low political level that can be overruled or ignored by others (e.g. wanted state of emergency declaration, but was denied)	Local government acting on citizens voters) mandate, was shown to be not strong enough to confront ISCOR
Date	1994 to 1996	1996 to 2000	1997
Where discussed	Chapter 7 - role of the state	Mostly chapter 6, responses in 7, 8 and 9	Chapter 6 and 8

The events that were unpacked above (and continued in Appendix 1) were then consolidated in narrative form into the strategies of the chief antagonists in chapters 6 to

9. But the exposition of the study's methodology is not complete without a methodological explanation of how these strategies – and the overall strategic terrain within which they function – can be synthesised into a description of a pollution dispositive, and its conditions of possibility. This follows below.

Describing a pollution dispositive

This work proposes to describe a pollution dispositive centred on the Vanderbijlpark steel factory. The dispositive, as discussed in chapter 2, is an approach developed by Michel Foucault and others, which allows us to focus on the interplay of material and discursive power, without erasing the distinctive characteristics of each and their relationship to legitimacy. In this thesis the idea of a dispositive is broadened to specifically accommodate the idea of discursive contests, in discursive arenas, using discursive resources, as discussed in the previous section.

Foucault understands a dispositive to be a "… formation which has an "urgence" in the original French). The (dispositive) thus has a dominant strategic function". It is "… a thoroughly heterogeneous ensemble consisting of discourses, institutions, architectural forms, regulatory decisions, laws, administrative measures, scientific statements, philosophical, moral and philanthropic propositions – in short, the said as much as the unsaid. The (dispositive) itself is the system of relations that can be established between these elements" (Foucault, 1980: 194).

Foucault's description implies that a dispositive is an intellectual construct which is built up through description and analysis. An analyst establishes the system of relations between heterogeneous elements - that is discursive and material elements – on the basis of a dominant strategic function. Note that the central logic of a dispositive is the function that it fulfils, which can be deduced from events and outcomes in the world, and not an intention that is ascribed to an actor, for instance a polluter or a fenceline community. The dispositive also needs to be describable as a historically specific formation.

How is a dispositive analysed? Jaeger and Maier explain that "discourses exert power because they transport knowledge on which collective and individual consciousness feeds. This knowledge is the basis for individual and collective, discursive and non-discursive action, which in turn shapes reality… Since knowledge is the basis for acting, we can analyse not only discursive practices, but also non-discursive practices and materialisations, as well as their relationships with each other… we call the interplay between discursive practices, non-discursive practices and materialisations a dispositive." (2009: 39). Therefore they suggest that a dispositive analysis has to include the following steps:

1. Reconstructing the knowledge that is built into discursive practices.
2. Reconstructing the knowledge that is built into non-discursive practices.
3. Reconstructing the knowledge that is built into materialization, and the non-discursive practices that have created these materialisations.

It is thus knowledge, or discursive resources, as this study calls them and their use in strategies in specific arenas that make up the common element to these analyses. Discursive power is the deployment of resources, so there is a sense of tactics in practice as well, not clearly captured by Jaeger and Maier's (2009) prescriptions, but central to this case study. This is important to the ability of this thesis to usefully describe a tactical terrain for EJ activists beyond a description of the pollution dispositive, and is picked up again in chapters 9 and 10.

The Steel Valley case is taken as a specific case of the operation of what is likely to be a broader South African pollution dispositive, located, as will be argued below, in the Minerals Energy Complex (MEC). The MEC spans a historical period of 120 years, and is responsible for very material transformations of the South African landscape, as well as far reaching institutional changes in the SA political economy, starting with the formation of the SA state during the 1899-1902 war, and continuing in various forms to today.

This type of heterogeneous analysis in which discursive and non-discursive powers interplay, and where the declared intentions do not match the real outcomes – but without interrupting the practice - has been used by a number of authors. Foucault's *Discipline and Punish* is the classic example of a dispositive description (Jaeger and Maier, 2009). It contains a great heterogeneity: the architecture of prisons that make both incarceration and surveillance possible, the strict rosters of activities, in turn supported by a discipline and discourse, including in criminology, psychology and state and public discourse of "improving" prisoners. While the prison system regularly fails in its declared objective of "correcting criminals" it does achieve a number of very useful effects in managing modern populations. By creating a permanent criminal class, moving in and out of jail, it creates a very persuasive incentive for other citizens to police themselves in order to avoid joining the criminal class and the state's rehabilitating disciplines for it. Thus an internalised hegemony around the self-management of populations is achieved.

Historian Ashforth (1990) uses Foucault's notion of "public spectacles" in analysing the construction of "The Native Question" through a series of commissions of enquiry following on the Anglo-Boer War which ended in 1902, in his *The Politics of Official Discourse in Twentieth-Century South Africa*. The work of these commissions was to procure black labour for the gold mines, without making it appear as a form of coercive labour, reminiscent of slavery, to the eyes of British philanthropic interests that had played an important role in the Anglo-Boer war, and who had used the issue of slavery as an important ideological weapon against the Boer governments. These commissions served to legitimize what soon became the migrant labour system and more broadly, apartheid. (James Ferguson's *The Anti-Politics Machine* (1990) also uses a Foucaultian approach to describe development and the state in contemporary Lesotho).

The Native Question or the cheap black labour dispositive in the MEC

As noted in chapter 1, the main argument for the "existence" of an MEC is made by Fine and Rustomjee (1996), while one important aspect of its history has been analysed by

Ashforth (1990) in his "The Politics of Official Discourse in Twentieth Century South Africa". His analysis can be read as a dispositive, and is presented here as an example for analysing the pollution dispositive in Steel Valley. At the same time, it provides useful insights into the historical background of the MEC and therefore of the Steel Valley dispositive that will be developed in the following chapters.

The central question in Ashforth's analysis is the ongoing construction of "schemes of legitimation" originally for the supply of cheap black labour to the mines, but simultaneously to legitimate the exclusion of black South Africans from political decision making through changing historical circumstances. To do this, he traces the knowledge construction operations in six landmark Commissions of Enquiry into "the native question". He describes how these commissions construct a subject of knowledge – the "natives" whose labour is needed in the mines – who cannot speak for himself, but is spoken for by experts whose opinions artfully articulate the dominant agendas of the day. What is constructed is knowledge useful to a strategic objective.

The first commission (1903 to 1905), achieved both a construction of the labour system in the form of "the native question" as well as "designing" the new South African state as a partial democracy for whites and a reinvented paramountcy for black South Africans (Mamdani, 1996). The central discursive work that the commission had to accomplish was to secure cheap, tightly controlled labour from an unwilling indigenous population, without making it appear as akin to slavery – especially to public opinion in Britain that had supported the Anglo-Boer war on the basis of opposition to slavery-like labour practices in the now vanquished Boer Republics.

Various knowledges were useful in these exercises: the knowledge of missionaries of "the natives" as a basis for expertise speaking an authoritative discourse on "the natives", a hegemonic racism accompanying the rise of Europe and the role of slavery in it (Magubane, 2007), a general belief in the "civilising mission" of colonialists, and the tactical experiences of indirect rule of the British Empire, including in India (Mamdani, 1996). Also important was the technical-political knowledge of "American mining

engineers", who advised the mining magnates on their strategic needs. Ashforth quotes Marks and Trapido (1979: 63, quoted in 1990: 57) to express the full menu of strategic imperatives for the mining magnates which was in the background of the more specific work of the commission whose task focused on constructing a workable and acceptable system of procuring cheap black labour:

> "Foremost among the demands (of the mine magnates) was the call for the transformation of the machinery of state; for a modern bureaucracy particularly a native Affairs Department, an effective police force and an uncorrupt judiciary. Next was the call for the elimination of the concessions policy and the operation of free trade with reduction and elimination of tariffs. Third, there were calls for mechanisms to control and direct labour. Fourth, there was the need to ensure the reproduction of the work force both black and white and associated with this the need to reduce the costs of essential foodstuffs, housing, and to ensure health and sanitation. Fifth, the magnates themselves sought a ring-keeper who would reduce and eliminate competition among themselves, and between themselves and commercial farming and commercial capital. Sixth, to reinforce the coercive machinery of state and to reduce the need for it, they sought institutions which would create ideological supports for the new economic order. These included a compliant press as well as a suitable adapted education system."

Ashforth concludes that "the mining magnates, then, believed that only region-wide political organization could hope to satisfy the industry's appetite for African labour" (1990: 57).

The reading of these discursive exercises as the backbone of (and window onto) a dispositive, engages with the heterogeneity of tactical elements that constituted them. The first commission's work was possible because of a history of colonial conquest and land dispossession that created the platform for labour reserves, including the very material and coercive wars that broke the backs of the independent black kingdoms during the last quarter of the 19th century, as well as the Anglo-Boer War (1899-1902) which paved the way for the reconstruction of the political economy of the whole region. What this illustrates is:

1. a strategic need – in this case for cheap, controllable, black labour
2. a work of legitimation, relying on discursive resources (pre-existing knowledges) in the form of hegemonic discourses
3. that work a transformation of social and political institutions,
4. and a transformation in the physical landscape.

Also noticeable is the heterogeneity of fields of knowledge and action involved in a dispositive. The central tasks of discursive power are not only legitimation, but an intellectual scheme for transforming social and physical realities. The 1903-1905 commission also established an intellectual domain, 'The Native Question', "in which the knowledge, strategies, policies and justifications necessary to the maintenance of domination were fashioned." (1990: 1). Ashforth traces the transformations in later commissions of inquiry (through segregation, apartheid and apartheid reform) as these commissions responded to the challenges of changing circumstances in the South African political economy. These challenges included active resistance from the dominated black South Africans, who were repeatedly, and in each time in different ways, constructed as "subjects of power who are less than full citizens, while expert representations of 'problems' and their 'solutions' are made to stand in for political representation of people" (Ashforth, 1990: 180).

A variety of knowledges and practices form part of the parade of these commissions. For example, Ashforth identifies three "social sciences" useful in the construction of the Tomlinson Report, the blueprint for apartheid's homelands: the anthropology or ethnology of Afrikaner ethnologists essential to the construction of the homelands, a theology accepted by Afrikaner churches of the "destiny of nations" which black South Africans, divided into tribal entities, were destined to fulfil, and economic science which "provides a language in which it can be shown how the material requirements of development, focused as it must be on a homeland, can be secured" (Ashforth, 1990: 180). So, as the challenges changed and new legitimation schemes needed to be reconstructed, different knowledges were drawn in. This last point is important for the methodology of our study of a pollution dispositive. This study focuses precisely on the

challenge of a major transition in the practice of pollution and pollution regulation, in which not only knowledges, but schemes of legitimation of pollution had to change radically.

Conclusion: Analyzing the Steel Valley pollution dispositive

Whereas Ashforth takes a broad sweep of history, this study focuses on a single case study during the transition to a democratic South Africa. That transition, as discussed in chapter 1, was accompanied by another decisive break in discursive practice: a new found relationship between production and the environment in the shape of environmental management and its more radical alternative, Environmental Justice. In giving the background to the Vanderbijlpark Pollution Dispositive, the detailed work of this thesis, the MEC will be considered as a proto-pollution dispositive in coming chapters.

Here are the outlines of this description that will be developed more fully in coming chapters: *A dispositive is organized around a strategic function*. In this case, the strategic function is to continue the previously unhindered pollution that accompanies an extractive economy, the MEC, which has been exploiting mineral resources in Southern Africa for 120 years, and has built a similarly polluting industrial economy through the extension of the MEC. This strategic aim may change over time, as it is confronted with challenges. In responding to these challenges, it builds up strategic knowledge and tactical experience, and may well absorb some of the challenges into its own strategies.

The elements of the pollution dispositive are heterogeneous. The pollution complex contains discursive elements like disciplines, knowledges, codes, regulations, wisdom, publishing; material elements like instruments, microscopes, laboratories, samples, chemical analysis reports, consultants reports, slagheaps, scrap iron, iron furnaces, effluent treatment works, rivers, factories, fences. *These elements are held together discursively*: by various knowledges, including strategic management, chemistry,

geology, engineering, public relations, financial reporting, legal practice and community outreach.

The description of a pollution dispositive at work in Steel Valley is composed in three broad steps. In **chapters 4 and 5**, a background of the dispositive is given as building blocks: a description of the Minerals Energy Complex, as the central dynamic of the political economy and, based as it is on mining, heavy industry and centralized finance, a prime example of the capitalist "treadmill of production" (Schnaiberg, 1980; Gould *et al*, 2003), resulting in literally mountains of waste and radical transformations of the landscape. These material transformations are traced in chapter 4. Chapter 5 describes the steel factory at Vanderbijlpark specifically as a source of pollution, and the Steel Valley settlement as the fenceline community receiving the pollution. These two chapters provide crucial building blocks to describing the *pollution machine*. As was explored above in the discussion on the commissions of enquiry (Ashforth, 1990), the Minerals Energy Complex as dispositive had as its most important initial legitimation challenge the political issues and ramifications of the mining industry's need for cheap labour. The argument in this thesis is that after 1990, this complex also became a *pollution dispositive* as it was challenged to legitimise its pollution.

Other aspects are only revealed as the pollution complex, working under colonial and apartheid conditions with few constraints is confronted by a very different discursive space under the post-apartheid new South Africa. When it is forced to deal with an "urgence", it develops discursive strategies to deal with a new question: the need to legitimate its pollution**. Chapters 6 to 9** describe and analyse the deployment of discursive resources in a number of crucial arenas in the strategies of the main players in the struggle about continuing pollution. This provides a window into how the pollution dispositive operates, and continues to operate. Finally, these descriptions are brought together in chapter 10 which also explores its conditions of possibility and its broader applicability in South and Southern Africa.

Chapter 4: The Minerals Energy Complex and the Vaal Triangle: 1878 to 1994

Introduction: the Minerals Energy Complex and surplus power

A history of 120 years of mineral extraction and related industrial development forms the material foundation of our description of a pollution dispositive. Based on the mining of vast deposits of shallow coal and deep, poorly concentrated but extensive deposits of gold, a small number of huge mining-industrial and finance conglomerates emerged. This established the pattern of powerful South African conglomerates: financially strong, with huge staff complements, with political influence, and with the means to contest attempts at regulation as well as citizens asserting themselves. This configuration is described as the Minerals Energy Complex (MEC), a physical system of extraction based on mining, which extends into beneficiation of mining products, the creation of secondary industry producing inputs for mining including steel, transport and food (Fine and Rustomjee, 1996). It is accompanied by a socio-political system that changed through time: the massive movement and simultaneous control of people as labour in the migrant labour system, the later homeland system and local apartheid spatial ordering. This in turn was accommodated through a political system, which was apartheid in a unitary South Africa based on white franchise. The parastatals, ISCOR, Eskom and SASOL, as well as state sponsored knowledge institutions, the universities, Council for Scientific Industrial Research (CSIR), Geosciences Council and others, served this complex and created a knowledge base for it, as well as the conditions in which the big mining conglomerates, now extending beyond mining, could control scientists directly or indirectly (compare Schnaiberg 1980). The MEC provided the mould for the culture of big corporates in South Africa in terms of the migrant labour and compound system (Clark, 1994). ISCOR is embedded in the MEC, of which it forms an important part.

This chapter focuses broadly on the material transformations of the Vaal Triangle through the activities of the MEC. These activities resulted in the creation of a South African industrial heartland through the development of the locally available "natural resources": the Vereeniging coalfields and the Vaal River water supply, which is now characterised by intense pollution. In terms of discursive elements this chapter describes both colonialism and apartheid as forms of surplus power which created a narrow discursive space in which opposition invites very direct coercion. This coercion provoked the creation of political discursive resources which is illustrated in this section, and later provided discursive resources for an Environmental Justice movement in South Africa.

South Africa's Minerals energy complex

The description of the South African political economy as dominated by the Minerals Energy Complex was developed by Fine and Rustomjee (1996). They describe the MEC as both "a core set of industrial sectors which exhibit very strong linkages with each other and relatively weaker linkages with other sectors" and "a system of accumulation" (1996: 91). The current South African MEC encompasses, at a minimum, the following sectors:

- "coal, gold, diamond and other mining activities;
- electricity;
- non-metallic mineral products, iron and basic steel industries;
- non-ferrous metal basic industries (platinum, silver and ferrochrome); and
- fertilizers, pesticides, synthetic resins, plastics, other chemicals, basic chemicals and petroleum" (1996:79).

Fine and Rustomjee (1996) argue that conventional statistics disguise the structure of economic and political power. Conventional statistics separate processes like smelting and refining from mining, although these are continuous with mining, and clearly controlled by mining groups. Electricity should also be added to a Minerals Energy Complex, because it is more than 90% coal based. Coal is also the basis, through SASOL, for the production of petroleum, gas and a wide range of chemicals, fertilizers

and plastics, even though these are conventionally separated out in statistics as "industrial production". Other mineral products should also be included in a description of the MEC as the real core structure of the South African economy, for example energy-intensive cement production, as well as iron and steel industries whose major inputs are iron ore, coal and electricity. The MEC thus described is highly integrated: 58.3 per cent of its inputs are from within the MEC, and 27.7 per cent of its output is returned to MEC sectors. Steel manufacture, for example, sources 62.8 per cent of its inputs from within the MEC, while 22 per cent of its output is returned to the MEC (1996: 81).

The MEC historically grew from mining, with its origins in the last quarter of the nineteenth century. Geotechnical challenges in subsurface gold mining early on led to a concentration of capital: between 1887 and 1932, the number of gold mining companies on the Rand shrank from 576 to 57 which were in turn controlled by six major groups (1996: 98). The Anglo Boer War of 1989-1902 was a direct outcome of the conflict between a growing MEC and the Transvaal Boer Republic (Turton *et al*, 2006; Lester *et al*, 2000). In the wake of the war, South Africa assumed its modern shape from the four pre-existing provinces, and developed its state machinery. In turn, the state supported the MEC by providing railway, harbour, fuel pipeline and telecommunication facilities. It also invested directly, and heavily, in "large-scale core industries such as steel, chemicals, processed minerals and energy" (1996: 108). Prominent amongst these investments are the huge South African parastatals: the steel maker ISCOR, established in 1927 as a parastatal and privatized in 1989, the state take-over of the electricity producer Eskom, established in 1923, but not dominant until its takeover of the Victoria Falls Power Company in 1948 after which it continued as a parastatal into the present (Gentle, 2009); and SASOL, the coal to liquid fuels and chemical manufacturer, also in the Vaal Triangle. SASOL was started in 1952 and privatized in 1979. From the 1960s, coal, ferro-chrome, platinum, vanadium and copper mining became more prominent in the MEC. Mining capital expanded into industry and banking, along six axes of finance capital that dominate the South African economy (Fine and Rustomjee, 1996).

A massive waste stream has been produced by the MEC. In 1992 estimates produced by the Council for Scientific and Industrial Research (CSIR) stated that 87.7% of South Africa's waste was from mining, with an additional 3.9% from power generation (ash) and 3% from industry. This amounted to a total of 468.2 million tons per year in 1992. While the figures are disputed, the relative proportions clearly show the overwhelming contribution of mining to the creation of waste (Hallowes and Munnik, 2008).

The MEC has been described as largely self-sufficient, "using capital-intensive high-technology and a minimal labour input that could be sourced anywhere, to exploit natural energy and mineral resources". Its self-sufficiency and global perspective has also meant that it has "delinked from the social and economic problems" experienced in South Africa (Eusten-Brown *et al*, 2006: 15).

In apartheid South Africa, the MEC functioned as an important empowerment vehicle for the Afrikaner segment of the population. Afrikaner affirmative action (Afrikaners as a population group were politically dominant from 1948 to 1994) took place from the 1950s onwards, both in the parastatals which were heavily dominated by Afrikaners, and in mining sectors, starting with coal but progressing to other sectors (Hallowes and Munnik, 2006; Fine and Rustomjee, 1996; O'Meara, 1996).

A renewed round of accumulation through the MEC, this time a project to build an emerging black middle class aligned to the ruling ANC, also uses the base of the MEC. In the new South Africa, there is an expansion of the MEC, in which BEE, or the black middle class plays an important role, to the point of undermining regulation and ecological modernization. As Freund (2009: 21) remarks:

> "… The core of the MEC has also been the conscious heart of the programme to hand over controls and assets to some extent to a new black elite with connections to the BEE programme. It was not an accident that the mining sector was the first to proclaim BEE targets and that the big boys of BEE, Motsepe, Sexwale, Macozoma and the like have been linked to the heart of the MEC whilst very highly paid black executives have taken over key parastatals."

This use of the MEC gives a structural inevitability to the confrontation between the capitalist wing of the ANC and the fenceline communities affected by the MEC. This in turn places strain on one of the central tasks of the ANC in its role as the new South African government: to re-establish the legitimacy of the state. The terrain for this confrontation is the struggle for Environmental Justice.

Environmental Justice and the MEC

As the Environmental Justice analysis framework entered South Africa, it was immediately related to the Minerals Energy Complex and its core logic, migrant labour, whose effects persist in post-apartheid South Africa. The following quotation from the book covering the inaugurating conference of the Environmental Justice Network Forum (EJNF) in 1992, gives a visceral sense of why the concept of Environmental Justice made immediate sense to South Africans, and how it was immediately related to the MEC:

> "Seven years ago, my husband was taken away to work in the mines. Before he was recruited, the company subjected him to a rigorous medical check, to make sure that he was healthy and strong. A sick person is not only unable to give his all to the company; he could also be a liability. So he left, fit, strong and hopeful. Seven years later, he returned, weak, skinny and broken, coughing his lungs out. He had tuberculosis (TB) and was discharged because of it. He could no longer give his all to the company. His all was now worth nothing in money terms to the company. He was a liability. I am not only worried about my husband dying and leaving me and the children to fend for ourselves by whatever means possible, I am also worried that my children will contract the disease as well. I bear this pain and worry alone. The company does not care and does not help. Nobody cares. As a black man, he has to prove beyond reasonable doubt that his TB did not come from other sources. Usually, they say that the TB could also have been caused by our bad cooking, or our generally unhealthy surroundings, or because we are too dirty. When he dies, I wonder how I can pay for the children's school, though I know clearly that if they don't go to school, the options for them in future will be fewer and they might even become criminals. My husband is not alone in our community. He is not the first,

and will not be the last, to contract TB from the mines, waste away and eventually die or become incapacitated. Though we contribute to this country's wealth, nobody puts resources into our community. We beg, plead and complain for water. We don't get it. This suffering is increasing day by day, not diminishing. What can you do to help?" (Charles Abugre, quoting Kate Sihlangu, in Hallowes (ed), 1993: 9).

The MEC and the creation of Southern Africa

The Minerals Energy Complex, while centred on South Africa, extended into most of Southern Africa, and played a crucial role in the creation of a South African state. The central objective of minerals extraction – gold but also coal and other minerals – shaped an entire subcontinent in terms of institutions, the South African state foremost amongst them. The idea of "Southern Africa" is comparatively recent. It was first thought of as a single region with the mineral discoveries and exploitation of diamonds, gold, coal, copper and other minerals centred on the Johannesburg Reef, from the 1870s onwards (Wallerstein and Vieira, 1991). By 1910, the region had acquired its current structure of national borders through settler processes. Although the basis of its colonial constellation was forceful land alienation, settlement of Europeans and imposition of colonial political structures, its driving dynamic soon became the Minerals Energy Complex (MEC). The Johannesburg Reef, hosting the richest and deepest goldmines in the world, drew thousands of migrant labourers from almost all countries in Southern Africa. Many of them, for example the Mozambicans, were at first sent as virtually forced labour (Pitcher, 2002; Lanning, 1979).

The Minerals Energy Complex inserted itself into the southern part of Africa following the trails created by an earlier around of extracting wildlife products (especially ivory) and human labour in the form of slaves. In 1576, Portugal specifically set up Luanda as a slave trading depot (Hodges, 2004:23) and exported as many as 4 million slaves from Angola alone (Love, 2005:27). Large scale hunting decimated the free roaming herds that had survived together with pre-settler populations (MacKenzie, 1987). Meat from hunting

also provided a food subsidy for early settlers, and later prospectors and miners. Settlers and plantation companies took over large tracts of land, displacing and impoverishing local populations. While many slaves were taken from Africa and did not work in the South African MEC, it will be argued in later chapters that the institution of slavery created a practice of "disposable others", that can be argued to also apply to fenceline communities.

ISCOR is embedded in the MEC. The creation of ISCOR in 1927 was a state response to the strategic needs of large-scale industries, particularly the mines, and state interests, mainly the railways. Until then, the mines, which needed large amounts of steel for "steel machinery, hoists, shoes, dies and drills as well as corrugated iron for buildings" had to import all their requirements from overseas, which was expensive (Clark, 1994:31). Mine owners needed an iron and steel industry to have cheaper local supplies and to control the costs of their inputs over the longer term. At the same time, the new South African state, after the Anglo-Boer war and the unification of SA, needed steel for their expanding railway system. The railways were then the largest state owned enterprise in SA and soon to become the biggest employer of white labour. Both South African Party leader Jan Smuts and the PACT coalition of Afrikaner nationalists and white labour interests which ousted him in the 1924 whites only election, saw local steel production as a key strategy to industrialize SA. As Minister Cresswell of the PACT government put it:

> "The country will reap the full benefit not only in getting our own steel in this country, but also getting it at a cost to the consumer which would immensely stimulate the creation and establishment of other industries in the country… the complete and entire justification of the Government's action will be to establish a really adequate steel works which will supply the consumer of steel in the secondary industries with steel products which will tend to stimulate the general industrial development of the country" (quoted in Clark, 1994: 71).

Landscapes transformed: From the Vaal coalfield to the Vaal Triangle

The MEC has transformed the physical and social landscapes of the Vaal Triangle through coal mining, power generation and industrial development, which left behind waste, and water and air pollution, through the spatial development of mining areas, industrial areas, towns and townships. The combination of an easily workable coalfield with shallow coal and a plentiful water supply led to the Vaal Triangle developing into South Africa's first and to date, still the biggest industrial heartland. Since 1912 the Vaal coal field housed a number of power stations which, "in their time… produced mountainous ash heaps and major air pollution" (Hallowes and Munnik, 2006: 64). While the focus of electricity production from coal since moved onto the Mpumalanga coalfields, where industrial and chemical production also developed, the Vaal Triangle remained a site of heavy industry.

The present day Vaal Triangle consists of three historically "white" company towns: Vereeniging, Vanderbijlpark and Sasolburg, with their black neighbours Sharpeville, Boipatong, Bophelong, Sebokeng, Evaton, Orange Farm and Zamdela, plus other smaller industrial areas like Meyerton, power stations and coal mines, all set amongst thousands of small farms interrupted by a few larger farms. The three company towns were established to provide coal, electricity, water, steel, fuel from coal and chemicals for South Africa's industrial development. The following sections focus on the creation of the spatial framework of the Vaal Triangle. In Foucaultian terms, this is a study of the "materializations" of an extractive economy.

Vereeniging

Vereeniging was built with money made from the diamond rush, as it provided wood for fuel to the diamond fields of Kimberley After the discovery of coal in 1878, it provided coal, coal-fired electricity, water, steel and clay-based products to the Rand. Vereeniging

was thus an early result of the growth of the Minerals Energy Complex, with its base in diamonds, coal and gold mining after the first discovery of these minerals (Keegan, 1986; Trapido, 1986). The town of Vereeniging is often portrayed as the creation of Sammy Marks, who founded the ZA en OVS Mineralen en Koolen Vereeniging (South African and Orange Free State Minerals and Coal Company) in 1886, to profit from the discovery of coal in the area in 1878. "Vereeniging" literally means "company". The literature on Sammy Marks portrays him as a colourful figure, an immigrant who befriended then president Paul Kruger by buying a farm from him, and being rewarded with early industrial concessions (Mendelsohn, 1991). The Vereeniging company was also one of the first instances of a conglomerate, which became a dominant form of South African business. The Vereeniging combined interests in the diamond fields of Kimberley, large land holdings (22 farms in the Transvaal and Orange Free State on both sides of the Vaal River) on which sharecropping was practiced with forestry, coal mining, steel making, production of ceramics and township development. The Vereeniging Estates, while clearly part of segregationist South Africa, offered some opportunities for black peasant farmers that did not exist on the surrounding white farms. Nevertheless, they were still hostage to a system that was aimed at squeezing a profit out of them (Trapido, 1986).

Marks and his partners were "committed to seeking profits in every area in which capitalist development made this possible" (Trapido, 1986: 337), including distilling. According to Mendelsohn, Marks' biographer, Marks dreamt of creating a Sheffield on the Vaal, which would make use of the abundant water and shallow seams of coal in the area, to produce steel. Marks persuaded president Kruger to support a railway line from Pretoria to Cape Town, which passed through Vereeniging and created a ready market for the local coal. First the Vereeniging Estates, and then the town of Vereeniging, grew around these aspirations as more coal mines, power stations and a small steel industry were established. In 1912, the area's first steel plant – United Steel Company, USCO – was built. It is still in operation today as the Mittal Vaal plant and one of the top four polluters in the Vaal Triangle despite its small size, because the machinery is so old and its pollution control equipment is very out-dated. (See pollution table 4.1 in this chapter).

Vanderbijlpark

Vanderbijlpark is similarly portrayed as the creation of a single person, after whom it was named: Johannes Hendrik van der Bijl, the founding head of ISCOR. Van der Bijl is a fascinating figure. He could be described as the original South African heroic scientist-engineer. A family friend, the then South African Prime Minister Jan Smuts from the pleasant area of Irene near Pretoria, recognised his brilliance and supported his career. After studying and working in the United States, Vanderbijl returned to South Africa to become the first government chief scientist. During World War II he was in charge of War Supplies. As head of the Industrial Development Corporation, the parastatal electricity producer Eskom and steelmaker ISCOR, he designed and drove the industrialisation of South Africa up to 1948. The Vanderbijlpark Steelworks, and the associated town, was Van der Bijl's last great work. A picture (see Fig 4.3) in the 1948 brochure for Vanderbijlpark (VESCO, 1948) shows Van der Bijl with a map of the proposed development.

At the centre of the map is the Vanderbijlpark Steel Works. To the south of the steel mill, towards the Vaal River, one encounters first a band of light industry using the basic steel products, followed by the white workers' suburbs, and lastly, close to the Vaal River, the big managers' and rich people's houses. Increasing distance from the steel mill also means decreasing exposure to direct pollution.

Vanderbijlpark was designed as a garden city with many trees, broad avenues and suburbs protected from the main traffic arteries. Street names celebrate the heroes of science and industry such as Bessemer, Becquerel and Westinghouse, and composers Chopin and Beethoven. In Van der Bijl's plans as described in a brochure the (white) residential areas are made as safe as possible:

> "The arrangement of straight boulevards and curving streets will… ensure and facilitate a flow of fast-moving traffic along the outskirts of the residential areas and a moderately-

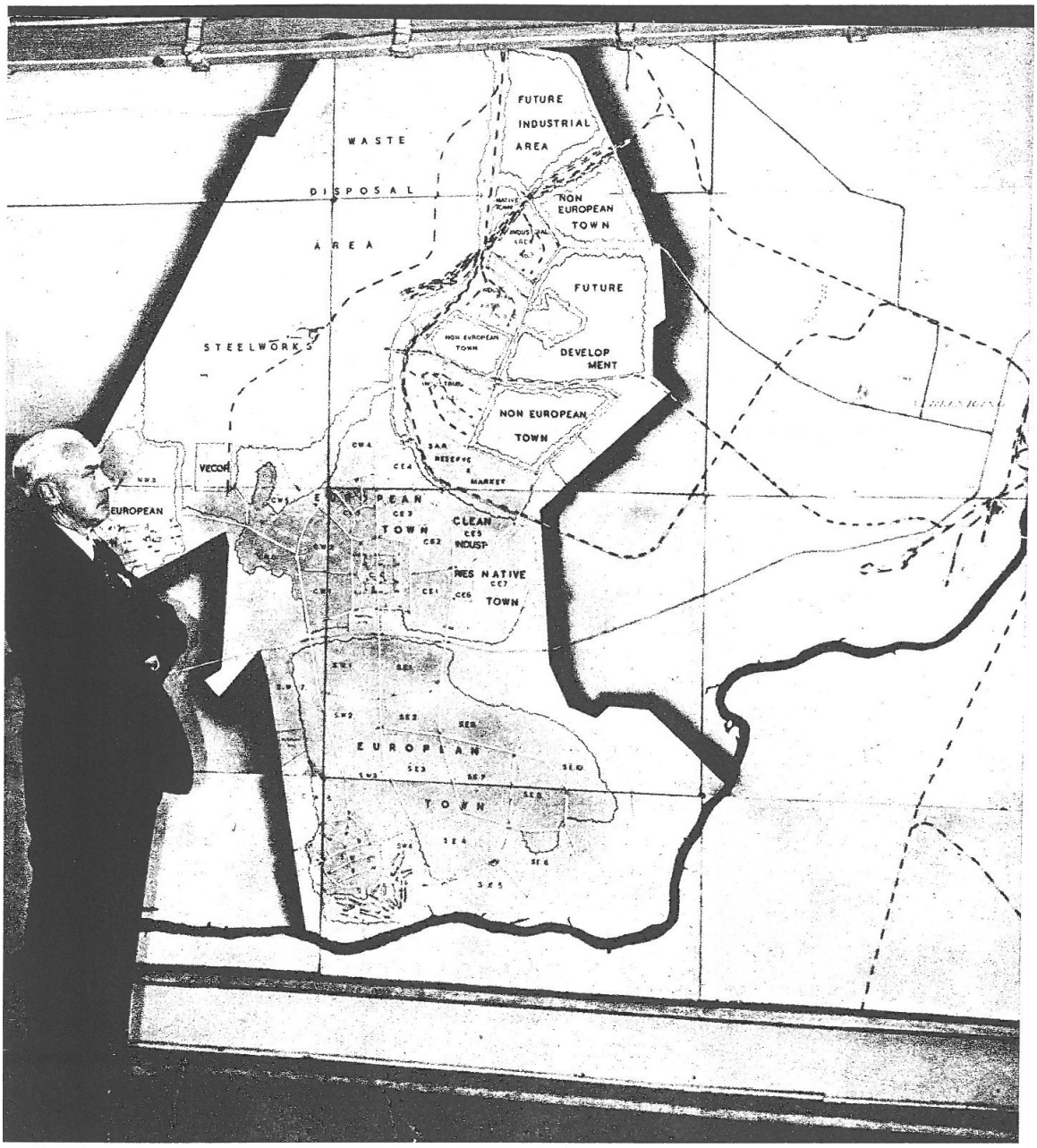

Fig 4.1 Vanderbiljpark as imagined by Vanderbijl. Picture from VESCO Brochure, 1948.

paced flow of traffic in the townships. In keeping with the idea of maintaining the highest possible safety factor in Vanderbijl Park, the sites for schools, playgrounds and other places frequented especially by children, have been located in positions which will make it

unnecessary for small children to cross a main traffic route to reach any of the aforementioned places" (Vesco, 1948: 15).

Black workers, as the brochure declares, would be housed in…

> "…reserves in close vicinity to their undertakings, so that the minimum of time will be lost in getting to and from work. [This will] also obviate the traffic of non-Europeans through European townships and the centre of town while on their way to work (Vesco 1948: 7).

The black suburbs were peripheral to the garden city. Boipatong was built to the East of Vanderbijlpark, in the way of the prevailing wind from the steel mill. Bophelong, quietly tucked away to the West, started life as Van der Bijl's model township, even mimicking "the traditional 'kraal' formation" in the design of residential blocks of houses (Vesco, 1948: 26). When the Nationalist Party refused extensions to it, Bophelong became very crowded. Cyril Diwu, who arrived in Van der Bijl's model township of Bophelong in 1954, recounts that, "We allowed our children to build backyard shacks behind our houses, in the space where we had been growing mealies and vegetables." (Interview, June 2006, quoted in Hallowes and Munnik, 2006).

Vanderbijlpark was run as a company town by the Vanderbijlpark Estate Company, VESCO. In the 1950s, rising Afrikaner nationalism led to independence for the local authority. This victory is reflected in streets named after Boer War generals, cabinet ministers and early Afrikaans writers. Around half of Vanderbijlpark's working population was employed by ISCOR (Prinsloo, 1994). In the workplace, Afrikaans was the main language, and not the pidgin Fanagalo, a mixture of Nguni, English and Afrikaans, widely used in the mines and much of industry (Hlatswayo, 2003). Like other parastatals, ISCOR came under increasing Afrikaner influence. By the end of the 1950s:

> "After a decade of Afrikaner rule, just as in the public service, the middle and upper echelons of the wide network of parastatal organisations were virtually monopolised by Afrikaners… (and) state capitalism was greatly extended. The public sector share of the

> economy almost doubled in the first 25 years of NP rule. New parastatals were established and the power and penetration of existing ones were extended. Between 1946 and 1973, the share of state corporations in gross fixed investment in the South African economy rose form 6,2 per cent to 11,5 per cent – this during a period of rapid economic growth. Afrikaner businessmen were appointed to key positions on state economic boards and to senior management positions in state industries and key public corporations such as the South African Railways and Harbours, Eskom, ISCOR and SASOL." (O'Meara, 1996: 79).

Surplus power and apartheid in the Vaal

The ISCOR Vanderbijlpark steel factory played a central role in the industrialisation of South Africa. The Vanderbijlpark steel mill was built after World War 2, a second phase addition to the ISCOR that had originally been established in 1927. The Vanderbijlpark mill was a crucial plank in ISCOR's strategy to stimulate industrial production and insert itself into profitable production streams. This strategy had been undermined by the demands that the war effort had made on the parastatal. ISCOR's chief, Van der Bijl, was also the Commissioner of War Supplies. As part of the war effort, ISCOR was forced to support the expansion of other, downstream steel industries into the manufacture of armaments, while ISCOR's works were limited to producing the raw steel inputs for them. After the war, Van der Bijl planned "to eliminate as far as possible the partnerships with private capital that had been so necessary in the early years for the corporations, so that ISCOR and Eskom would not be hindered in their operations by uneconomic marketing arrangements" (Clark, 1994:117). Van der Bijl was not opposed to private enterprise, and repeatedly suggested the privatization of ISCOR.

The Vanderbijlpark steel works was designed to be the physical base of this new strategy. It would be vertically integrated "with ISCOR mining iron ore and coal, producing raw steel, and manufacturing the steel billets into finished products in mills and manufacturing works for which ISCOR subsidiaries had provided the machinery" (Clark, 1994:116). The new plant was a modern continuous strip mill, where all of the country's

requirements for flat rolled products – plates, sheets, tube strip and tinplate – could be made.

As ISCOR Vanderbijlpark was taking shape, South Africa came under apartheid rule, an influence which became central to ISCOR's history and working culture. Equally important was that the new steel mill relied on continuous production, associated with Fordism, in which machines, not people or ecosystems, are the dominant components. As an integrated steel works, the Vanderbijlpark plant was an instance of the growingly influential 'Fordist' production model of corporate America. These massive plants were made the centre of a larger system of 'vertical integration' of production - from raw material inputs to the marketing of products - under the control of the corporation. Fordism also meant increased control by management over the labour process, via continuous or assembly line production where machines, not artisans, set the pace of work. In South Africa it was given a racial twist, as illustrated in this trade magazine from the mid-forties: "… the only way to bring a native into industry was to put him on a conveyer belt, where if he stopped working for a moment something red-hot fell on his foot" (quoted in Webster 1985: 85).

In the building of the Vanderbijlpark plant, ISCOR faced financial and political hurdles. Although then Prime Minister Smuts approved the plans, he provided only half the funds that were needed. By 1947 costs were rising and the shortfall was even bigger. In the 1948 general election, with a minority of votes but a majority of seats overall, the National Party took power. The new National Party government was very concerned with fiscal austerity during the immediate post-war trade crisis and would not spend on a new ISCOR plant. They were also suspicious of Van der Bijl (a Smuts man) and ISCOR. But by this time Van der Bijl was seriously ill with cancer. He was succeeded by Frikkie Meyer, who was close to the National Party and rumoured to have close connections with the Broederbond (secret Afrikaner organization). Meyer succeeded in getting the funds and construction on the Vanderbijlpark plant started in 1948 (Clark, 1994).

ISCOR's apartheid workplace

Apartheid's surplus power could be seen most nakedly at work in the apartheid workplace. The ISCOR workplace was characterized by intense racism, called "*baasskap*" (the Afrikaans word translates directly as "the quality of being bosses"). It meant that all whites were bosses to all black workers. Blacks could not look whites in the eye without inviting abuse, as Karl von Holdt documents: "Hey, why are you looking at me? Seemingly you have become white now?" (2003: 33). Black workers had very few rights and little recourse. Any objection or retaliation to assault, opened the risk of dismissal. Dismissal in turn would have far reaching consequences, as housing and the right to be in the urban area were both tied to employment. Constant racial insults, repeated physical assaults and endless rituals of white supremacy and black subordination reproduced the racial hierarchy on a daily basis. Facilities such as washrooms and canteens were strictly segregated by law until 1983, and in practice well into the 1990s. Any white worker, whether a supervisor or not, could issue instructions to any black worker. Instructions extended beyond work to personal service. Black workers were ordered to wash cars, bring tea or go out to buy cigarettes (Von Holdt, 2003).

Descriptions of the ISCOR apartheid workplace are particularly horrific. Researcher Irene Loebell interviewed black steel workers about working under apartheid and concluded that they experienced a "systematic … dispossession of the body" (Loebell, 2005: 14). ISCOR worker Lucky Maphutha told her, "You know, blacks were used like tools. Where there is hard work, blacks were always taken." Pasco Mzwabantu worked almost his whole life at ISCOR. He said, "By that time, there were no machines at ISCOR to help us … We were the first people to be the machines of ISCOR, we were the people who were doing the work of the machines of today" (Loebell, 2005: 14). He worked at a furnace where it was so hot that work teams had to be relieved every five minutes. Supervisors stood behind the workers to push them back in when they retreated from the heat.

All the workers interviewed by Loebell complained about exposure to heavy dust, chemicals and fumes, and later suffered from occupational diseases like high blood pressure, diabetes, respiratory problems and chronically infected eyes. Mzwabantu recalled:

> "The place where we were working was dirty, so the smelling of the chemicals and of the scrub, it goes into your chest. So when you sleep there is something like dizzy, so you cannot sleep well because it jeopardizes the soul inside. When I cough, things come out from the mouth, it is terrible." In the mornings he could barely get up. "You need somebody to push you and shout at you: 'Let's go to work!' You cannot wake up yourself, because your body has got something in the soul" (Loebell, 2005: 14).

Mondli Hlatswayo describes ISCOR, for black workers, as a "total institution" in which every aspect of the migrant labourer's life was controlled by the parastatal employer. For example:

> "The entrance of African workers to ISCOR was defined by racial despotism and humiliation. To compel African workers to work at ISCOR under dangerous conditions, it was not enough for ISCOR to show African workers that it possessed physical strength in the form of security guards and support by the apartheid state. Above that, at a psychological level, ISCOR had to convince African workers that they were inferior and had no power to challenge the factory regime at ISCOR…" (2003: 73).

Such humiliation included being forced to strip naked in public for a medical examination, and being smacked by clerks for not standing in queues. Once employed, workers were forced to wear wristbands with numbers which identified the individual (to the police outside as much as to ISCOR supervisors) and indicated whether the worker lived in the compound or outside ISCOR grounds. The compound was an instrument of control. It was fenced, and had only one exit point:

> "Conditions in the compounds were atrocious. It was cold in the compounds, rooms had no ceilings, workers had to use a homemade coal stove to heat the place, and beds were made of cement. Workers had no privacy because more than 20 workers lived in one room… About 20 men would shower at the same time and toilets provided for no privacy. (2003: 83)

Compound food reinforced the sense of alienation from the self. According to Thembelani Nyingwa, "When they cook … a cabbage, they use a spade to cut it off, not a knife." Maxin Mtambeki added, "The food was rotten … When the [meat] ration was cooking there were some worms walking on top of that ration" (Loebell, 2005: 14). While this description may be exaggerated, the food was generally seen as bad. Mzileni Mbele said: "This food was bad and it was a soup. There was a mixture of tomatoes with leaves; cabbage was also not done nicely. This was called *isihlophoyiya* (concoction of food). We used to eat pap that was grade 3 and one piece of meat and a spoon of gravy" (Quoted in Hlatswayo, 2003:95).

ISCOR had played an important part in the history of apartheid, crucially supporting the apartheid's economy growth during the global golden age of capitalism. In this period, it was filled with confidence. It benefited from cheap black labour and racism was entrenched in its culture. A labour regime, in which ISCOR treated its workers like less than human, would predispose ISCOR management to also disregard their smallholder neighbours. It had experienced only soft regulation from government – of which it formed a part as a parastatal. There was very little in this history that prepared it to deal with environmental challenges and responsibilities in the 1990s and beyond.

In the 1950s, a third company town, Sasolburg, was established south of the Vaal River, to house a coal-to-liquid fuel plant: SASOL. The township that houses its workers, Zamdela, means "they despise us" (Hallowes and Munnik, 2006). Its history is not treated here, but its fenceline communities did become part of the Vaal Environmental Justice Alliance, which is discussed in chapter 9.

Also in the 1950s, apartheid politicians started to put into place not only a battery of legislation designed to entrench racial superiority, but also to order the space of the Vaal Triangle along racial lines. Its conception and execution in Sharpeville and Evaton are two more examples of the surplus power that disregarded the majority of South Africans and their rights – and spurred the growth of political consciousness and resistance in the Vaal. Land alienation under apartheid was a grinding, ongoing process of dispossession in the Vaal Triangle, as the following account of events in Evaton shows. Apartheid deeply affected the spatial structure of the Vaal Triangle. But one of apartheid's side effects was to create a pool of discursive resources, similar to that of the US civil rights movements, from which an Environmental Justice movement could later be built. The Vaal Triangle was intensely politicised during the apartheid era. This politicisation was achieved through discursive and symbolic action, which included mobilization leading to early bus boycotts, strikes, demonstrations, insurrections and also poetry, music, and political discursive resources embracing knowledges, histories and organizing skills, in other words: discursive resources.

Evaton

Evaton was one of the very few black freehold areas under apartheid, similar to Alexandra in Johannesburg. The story of its slow dismemberment by the dynamics of apartheid is a horror of the bureaucratic imagination of apartheid, reconstructed here from documents lodged in a failed land claim (Wildebeestfontein Stand Owners Association, 1998). Evaton originated from the sale of portions of the farm Wildebeestfontein by the owner, Elizabeth Adams, between 1904 and the mid-1930s, as stands in private title to African people. After the war, Evaton emerged as a centre of resistance. In 1955, residents joined the bus boycotts initiated by the people of Alexandra. During the 1960s, a battery of legal but exploitative practices was used to deprive stand owners of their land:

> Under apartheid laws, stand owners were not allowed to sell land to other black South Africans, so the local authority became the buyer. When a stand owner died, attorneys handling the estate could alienate the land in lieu of compensation for their services.

> Heirs had to qualify in terms of section 10 of the Black (Urban Areas) Consolidation Act before they could receive title and if they did not, the land was sold to the local authority. Stand owners were threatened with forced removals and pressurised into selling their land to the local authority. The local authority levied charges to put the owners in debt which then allowed the authority to alienate the land. Owners had to pay for residence permits as well as rentals to the local authority. Lodgers had to pay rentals to both the local authority and the owners. Services had to be paid, even though these consisted of night buckets and pit latrines only. Those who resisted suffered legal proceedings and their land was sold in execution. The local authority also carried out expropriations under false pretences, for example, claiming that land was needed for roads and schools but then using that land for housing. Some owners never received compensation, others refused to accept the inadequate compensation on principle (Hallowes and Munnik, 2006: 87).

Sharpeville under apartheid

Sharpeville, situated between Vereeniging and Vanderbijlpark, is an internationally known symbol of apartheid – and another important instance of political discursive resources built up under apartheid.

In 1961 Sharpeville became the scene of a massacre that focused the attention of the world on the cruelties of apartheid. Sharpeville had its origins in Top Location, which housed black workers working in Vereeniging. As Vereeniging grew, two thirds of black workers were living in the backyards of (white) residential areas, or simply in buildings at the back of factories, which meant that they were exposed to air pollution night and day. By 1910, the Vereeniging municipality had made available a commons for black self-housing. This was Top Location, home to 576 people in 1919 (Frankel, 2001).

The lives of the people of Top Location were tightly controlled by a set of rules enforced by a 'native' administration under a white superintendent, assisted by black policemen. Residents had to be approved by the superintendent. Approval depended on work permits. Residents had to provide their own dwellings, which they could sell (the

buildings but not the land) only to persons approved by the superintendent. Sanitation was in the form of a bucket system. Buckets were removed three times a week. Water was provided in standpipes. Later, public shower facilities were provided with separate blocks for men and women. There was no drainage system, however, so water ran into neighbouring yards.

The administration was funded from the 'Native Income Account'. Services and amenities were limited to what could be paid out of this account after the salaries of the superintendent and his black policemen had been met. Its income came from rents, fines and licences and from the administration of work permits. It also earned income from a monopoly on brewing and selling beer and penalised women who brewed beer to supplement their incomes. People thus had to pay for the means by which they were oppressed, a principle that served apartheid well and which endures in the administration of 'cost recovery'.

In 1935, the municipality decided that the people should be moved from Top Location. The municipality argued that the land was needed for industrial development. This development never took place and today the site houses the Teknorama Museum which sports a building, housing the gifts to the last apartheid president, F.W. de Klerk, who represented the white constituency of Vereeniging in parliament, next to a museum dedicated to the struggle against apartheid, including the Sharpeville massacre.

Sharpeville was originally planned in 1935 as a 'model township' but this idea was abandoned by the Vereeniging municipality, due to cost considerations. People started moving in from 1943, many of them voluntarily according to political scientist Philip Frankel, as conditions in Top Location deteriorated. To finally force people out of Top Location, the municipality then halted all expansion and improvement in services. Conditions quickly deteriorated leading to outbreaks of pox, typhus, dysentry and infantile paralysis. War time production in the Vaal drew new black workers into Top Location – which had grown to a population of 15,000 people by the end of the war.

Tensions between landlords and tenants crowded into backyard shacks were acute and many people died from pneumonia, gastro-enteritis and tuberculosis.

When the National Party took over in 1948, the agenda of apartheid (literally "separateness") was to separate white from black. The removal of Top Location in Vereeniging to become Sharpeville, illustrates this history well. The final removal from Top Location to Sharpeville, in 1959, was carried out with the brutality typical of an apartheid forced removal. Until then, as Frankel notes, Sharpeville residents had shown little political fervour: they had not taken part in the 1950 May Day stay away, the 1955 Evaton bus boycott, or the Defiance Campaign and protests against the Bantu Education Act in 1958. The final removal created political dissent in Sharpeville:

> "People in Topville were simply informed that they were being transferred to Sharpeville irrespective of their choices or dispositions, and, after impossibly short notice, were bundled at gunpoint into municipal police trucks along with the bare minimum of their portable possessions. When people had possessions which did not fit the specifications of the trucks, they were simply left at the roadside. Thereafter, municipal bulldozers made short work of the crumbling shanties in order to clear the site for the speedy entry of the industrial developers…. (the) traumatised inhabitants arrived in Sharpeville Extension 1, known as Vuka section, to be confronted by little more than a collection of shacks and the most rudimentary of public health facilities – all on a bare piece of veld grandiosely labelled a 'site and service' settlement. This was particularly harsh on people who had previously been homeowners, who were sufficiently educated to comprehend the iniquitous workings of apartheid, and who had lost the accoutrements of a petit bourgeois township existence" (Frankel 2001:36).

A year later, on the afternoon of 21 March 1960, police fired on a crowd of people protesting against the pass laws in Sharpeville. The protest was organised by the Pan African Congress but joined by many people loyal to other organisations. They refused to carry pass books and marched to the police station to be arrested. Officially, 69 people died including ten children. Many were shot in the back as they tried to run away. The real number of people killed was much higher but could not be established as the state

had clamped down on information – and other activities – by declaring a State of Emergency. Police intimidated personnel at hospitals and cemeteries as far away as Boksburg and thousands of activists were detained. Many victims disappeared and some residents believed that the police dumped bodies in the Leeuwkuil Dam below Sharpeville.

According to Frankel, the massacre changed Sharpeville for ever. Many talented people left the community, and Sharpeville's excellence "in soccer, boxing, art and criminality", which rivalled that of Soweto, evaporated (Frankel 2001: 201). All development was halted. The apartheid authorities first considered changing the name of Sharpeville and later planned to erase the place itself through another round of forced removals, this time to Sebokeng. This was part of a wider plan to clear black people from the Vereeniging-Vanderbijlpark area but was never fully implemented.

ISCOR and the Vaal in the Golden Age of Capitalism worldwide

ISCOR prospered after the Second World War. The Vanderbijlpark (VDB) plant had commenced production in 1951, leading to a huge increase in output for ISCOR as a whole. In the following eight years, sales more than doubled (Clark, 1994). From 1960 and into the 1970s, boom times continued. In each successive year, ISCOR expanded its output and showed a profit. Publications from this time (ISCOR celebratory brochure 1925-1970) show that ISCOR saw its two objectives as meeting the South African demand for steel, and turning a profit.

The Sharpeville massacre, discussed above, did not dent the economic boom. However, it did accelerate South Africa's increasing international isolation. South Africa, under Verwoerd's leadership, declared a Republic, and left the Commonwealth. In 1962, SA also left the International Labour Organisation (ILO), an organization whose activities included developing and disseminating guidelines on occupational health and steel making and the environment (SA History online, website). This delinking may also help

explain why knowledge and practice of workplace health and safety and environmental care became unimportant concerns for ISCOR management.

Between 1960 and 1970, the economy grew at 5.6% per annum, and the average real per capita income increased at 3% per year. Manufacturing grew at 5.3% per year (from 1953 to 1960) and at 8% between 1960 and 1970. Worldwide, this was the "golden age of capitalism". Real growth rates in advanced Western economies averaged more than 4% per year before reaching the limits of post-war expansion around 1973, according to Moll (1990).

The iron and steel sector in South Africa was one of the main beneficiaries of this growth. During the 1960s, "the iron and steel sector absorbed more than a quarter of all annual fixed investment in the manufacturing sector. " (Fine and Rustomjee, 1996: 164). ISCOR recruited skilled, white staff from overseas, and in the 1970s, an average of 60 immigrant families per month arrived in Vanderbijlpark as job opportunities for whites increased by 40%. The metal industry increased its gross income from R168 million in 1957 to nearly R400 million in 1964. Further downstream, the engineering industry grew from a gross income of R593 million to R900 million in the same period, while job opportunities for whites in Vanderbijlpark rose by 73%, and for blacks by 48%. Prinsloo rightly calls this the phase of prosperity for Vanderbijlpark (figures from Prinsloo, 1994: 273 - 278).

Expansions to the VDB works in this time were ambitious and expensive: £56 million in 1958, R112 million invested in Pretoria and VDB in 1961, and R560 million to produce 6 million tons of steel by 1983 (Prinsloo, 1994: 277). ISCOR was also expanding in other parts of South Africa in the 1970s: the Newcastle works (1972) in Sishen, a harbour and new works in Saldanha (exporting iron ore) and opening a huge new opencast coal mine for producing high grade blend coking coal at Grootegeluk, near Ellisras, now Lephalale, in 1980.

ISCOR Vanderbijlpark was part of the "golden age of apartheid capitalism" in South Africa. In these terms it was therefore part of a "success story" at least until the late 1970s. It absorbed an enormous amount of financial investment in this period (Fine and Rustomjee, 1996). This was also a time of "Afrikaner economic empowerment" through education and career opportunities for Afrikaners and discrimination against non-Afrikaners.

But by the mid-1970s, the apartheid economic boom was over, and its political foundations were crumbling. Black South Africans had become a majority in "white" South Africa (the area outside the Bantustans). Reform was in the air. The Riekert and Wiehahn commissions were structuring a new deal which gave new rights to black trade unions and black urban residents (Ashforth, 1990). In 1973, black trade unions started organising, and black wages started rising. In 1984, black trade unions including the Metal and Allied Workers Union (MAWU), started organising at ISCOR Vanderbijlpark.

Internationally, economies outside OPEC were hit by the first "oil shock". A side-effect of the worldwide reaction to the oil shock was a sharp fall in the demand for steel. This profoundly affected ISCOR. In 1973/74, ISCOR had announced an ambitious R3 240 million expansion plan for the years 1974-1984, with the objective of achieving a production of 11,3 million tons of steel at its Vanderbijlpark, Pretoria and New Castle Works (Newcastle had been commissioned in 1974). However, at the end of the 1974, these targets were revised, due to "the shortage of skilled artisans, changes in the national economy, high capital requirements and the coke problem" (Prinsloo, 1994: 66).

The 1976 Soweto Uprisings presented a further shock to the apartheid economy. Now international reaction, unlike with the Sharpeville massacre, more than a decade earlier, made it difficult to access capital. ISCOR had been able to finance much of its capital requirements from its own income until 1968, but started borrowing from European countries (West Germany and the Netherlands) in 1971/72. But by 1977, these sources of funds had dried up as a result of international sanctions, and the expansion plans covering 1976-1980 were cut by 31.6% (Prinsloo, 1994: 66). The period 1982/1983 saw a definite

recession in the world market, and world steel demand slumped. The town of Vanderbijlpark was shocked by cutbacks in ISCOR's engineering affiliate, Vecor, and its eventual closure. Job losses led to lower demand and the town's businesses experienced a higher rate of insolvency (Prinsloo, 1994).

As the apartheid state lurched to its demise in the 1980s, ISCOR's troubles also grew. By the 1980s, South African markets had failed to sufficiently expand to ensure local sales for ISCOR. ISCOR by then depended on exports for the marketing of nearly 40% of its output. When iron and steel was included in the US embargo on South Africa 1989, ISCOR lost an important market. It also experienced recurrent labour problems (Clark, 1994: 167). Its difficulties were part of the apartheid crisis as a whole, and with the rest of the system, it went into transformation. In 1989, ISCOR was privatized.

Sebokeng and the Vaal Uprising

In the 1980s, the huge township of Sebokeng played an important part in another push against the crumbling apartheid system in the form of the Vaal Uprising. Sebokeng, a huge agglomeration of black townships to the North of the Mittal steel plant, is strikingly denser than the white residential areas. This is the result of apartheid policy, since the early 1950s, to concentrate black people in the Vaal into a single, massive township. Huge zigzag structures mark the area of the old migrant labourer hostels, some of which have been converted into family accommodation after apartheid. Sebokeng's confrontations with the apartheid government were many. The most famous – the Vaal Uprising of 1984 – is described by a Catholic priest who worked in the Vaal at the time, as part of "the final dramatic events that scuttled apartheid" (Noonan, 2003).

The long established pattern of cheap and nasty local government – in which black South Africans had money squeezed out of them to pay to be 'administered' – finally provoked its own demise in 1984. Its collapse started in the Vaal Triangle. Black Local Authorities had been installed in 1982 but were widely rejected as collaborationist structures. In the Vaal, the corrupt Lekoa Town Council announced a rent increase, despite overwhelming

evidence that residents could not afford even the existing rents. This provoked an insurrection that spread outwards from the Vaal. The Vaal Civic Association led the protests against the Town Council throughout August 1984. On September 2, it was decided that residents should refuse to pay their rents and a stay away call for the following day was supported by some 60% of the workforce. The police reacted viciously to the demonstrations in the townships that day. Scores were injured and 31 were killed. In Frankel's account, angry crowds

> … zeroed in on members of the Lekoa Town Council and other township officials whose ill-gotten gains were burnt in a purgative orgy of fire and destruction that eventually consumed the chairman of the Lekoa Town Council, the much-despised Esau Mohlatsi, and the Mayor of Sharpeville and two other councillors, all of whom were either hacked or stoned to death" (2001: 209).

The fires of resistance quickly engulfed other townships in the wider region centred on Johannesburg and then spread to the rest of the country. The government declared a State of Emergency in 1985. It was more like a war on the people. More than 10,000 were detained while the security forces were unleashed to act with unrestrained brutality. It failed to subdue resistance and produced only the stalemate of escalating violence. The event is celebrated in a poem by Johannes Rantete "Sebokeng you are great", that gives some indication of the political depth of feeling in the area, often overlaid by a calm outward appearance:

> "In that unmatched anger you broke into
> Violence to overcome the forces of oppression
> Imposed on you by your fellow brothermen
> That wrath you showed was more than
> That of a tempted black mamba
> When you demolished everything to ashes.
>
> You made a history that none of your residents will ever forget
> Your reaction so shocked the government

That it could not believe the damage done
Were only a protest against the rent hikes. Wrath of the mamba, zeal of the united,
Courage of the history makers –
I bow down to your everlasting greatness"

(Rantete quoted in Noonan, 2003: 111)

The polluted Vaal Triangle

The histories explored above resulted not only in the building of political resources as a result of ongoing struggle, but also in virtually unchecked pollution which impacted profoundly on the air and water quality in the area, including that of the Vaal River, after which the area is named. The surplus power of apartheid resulted in surplus pollution. Surplus power is an overwhelming power, which is in excess of the power immediately needed, in order to induce a longer term effect of intimidation, often through frightening spectacle (Foucault, 1982). An illustration of such power is embodied in the National Key Points Act. As one of the Steel Valley residents, Johann Dewing, described this act: "We were not even allowed to walk past the fence of ISCOR and look at the works" (Dewing, personal communication, 2004). This is an unreasonable power that immobilizes the polluted citizen, blinds the eye of the professional, and twists his or her tongue into silence. It is marked by a denial of reality: people have knowledge of the pollution but are forced to pretend it doesn't exist. But it is not unrelated to the racism as part of Fordism where people are subordinated to machine, and of course apartheid with its denial of humanity. Under apartheid, there was little public discussion of pollution, and even less recourse to any defence against pollution imposed on the neighbours of polluting industries.

The polluted Vaal River

The Vaal Triangle takes its name from the Vaal River, whose tributaries the Rietspruit, the Klip, the Suikerboschrand, the Taaibosspruit and the Leeuspruit it straddles. The Vaal is named after the murky colour of the water of the river caused by churned up clay particles (Vaal is Afrikaans for "khaki" or "dun" colour). The Vaal is often described, with some sympathy, as "South Africa's hardest working river". Its northern tributaries flow through the gold mining area and have been polluted by acid mine drainage. This river is now at the centre of a massive "replumbing" (see Pearce, 1992) of the catchments around it, which draws in supplies from across the Drakensberg in the Thukela, and reaches into neighbouring Lesotho's highlands for clean water. The Rand Water Board, which treats and supplies water to more than 10 million people and thousands of industries in Gauteng and beyond, draws its water from the Vaal Dam, upstream from Vereeniging and augmented by Thukela and Lesotho water. In 2009, water authorities were planning a pipeline to take Rand Water return flows to Waterberg coalfields up north on the Botswana border.

Before industrialization, the Vaal area was amply provided with streams, wetlands covered in reeds and a high water table, as the names of farms like Cyferfontein, Rietkuil and Rietspruit testify. Dense stands of reeds not only provided a home to bird and animal life, but also slowed down and cleaned up the water before it flowed into the Vaal River. Today, more than half the wetlands are gone and the water of the Vaal is contaminated by heightened salinity, heavy metals and acid mine drainage from gold and coal mines on the Highveld and industries in the catchment, as well as dysfunctional sewage works.

The emergence of the Minerals and Energy Complex had a profound influence on the Vaal River. Early gold mining in the last quarter of the 19th century on the Reef polluted the dolomitic aquifers that were the source of local springs and streams. This became a serious problem for the mines and burgeoning Johannesburg, and shortly after the Anglo-

Boer war of 1899-1902, the Rand Water Board was established to source water from the Vaal 70 kilometres away (Cooks, 2004).

In 1914, when the Vaal Barrage was built downstream of Vereeniging, both the Vaal and the Rietspruit which flows from the Rand were thought to be clean. In 1923, the Vaal Barrage was built and from there pipelines were laid over 70 km to supply Johannesburg. But by 1938, the Barrage water was also polluted and the Vaal Dam was constructed upstream of the Vereeniging industries and of the tributaries flowing from the Rand. By the 1980s, Barrage water could only be used if diluted with two thirds water from the Vaal Dam. In 1980, a conference was called to "Focus on the Vaal", partly because of its economic importance and partly because of the water quality crisis. An introductory lecture (Van Duuren *et al*, 1980). Stated that the load of average Total Dissolved Solids (TDS) in the Barrage had increased from 130 to 600 mg/l, in the period from 1935 to 1979. To demineralise the Vaal Barrage water would be very expensive, and who would bear the cost? This made it necessary for Rand Water to 'blend' this water with cleaner upstream water. This meant that investment in the Barrage was wasted but it also led to direct costs for people still using the water – about R100 million per year then – which was born 50/50 by industrialists and householders:

> … the following economic effects of an increase in TDS have been identified: Increased desalination and softening requirements for the production of boiler and cooler water; increased corrosion and scaling of steel pipe networks; increased cooling water requirements; increased consumption of soap and detergents; and, reduced lifespan of plumbing and water installations (Henzen *et al* 1980: 139).

The high salinity kills river life and takes productive and expensive irrigation fields out of production further downstream. The government's tolerant approach to industrial polluters had contributed to this situation. This was highlighted when SASOL's Dr Brink, thanked the DWAF for their patience with SASOL's failure to keep to their prescribed limits… SASOL had experienced environmental problems from the start. It was using five tons of water for each ton of coal and the resulting effluent intensified the salts pollution of the Barrage. The Vaal coal is high in fluoride and SASOL regularly

exceeded the legal limit for fluoride on its Department of Water Affairs permit (Brink, 1980).

In 1988, people complained about fish dying in the Leeuwspruit which flows past SASOL's effluent dams and into the Barrage. SASOL tested the water and found that ammonia levels in the Leeuwspruit were 20 times higher than would be allowed in Europe. It "maintained … that it was not necessarily responsible" even though one of its effluent dams had been repaired around that time (Tempelhoff 2003: 402).

Rand Water, which had provided water from the Vaal River system since 1912, was responsible for water quality. It developed an increasingly sophisticated monitoring system after the war with regular sampling backed by a sophisticated water testing laboratory built in Vereeniging during the 1970s. According to Tempelhoff (2003), its staff also kept up with international information and debates. However, says Tempelhoff, Rand Water downplayed pollution for the sake of promoting industrial growth and the expansion of its own market.

Air pollution in the Vaal Triangle

Official acknowledgement of a problematically high level of air pollution in the area came on 21 April 2006, when the then minister of environment, Marthinus van Schalkwyk, declared the Vaal Triangle a priority pollution area, because he "reasonably believed that the ambient air quality standards are being exceeded." According to South Africa's then National Air Quality Officer, Peter Lukey: "There is enough evidence to assume that citizens in the Vaal's rights to clean air that is not harmful to their health, as required in the constitution, are being violated" (Interview, 2006). A strategy to improve air quality in the area would be drawn up, giving attention to high emissions of sulphur oxides (responsible for acid rain and respiratory problems), nitrogen oxides, PM10 (small particulates that can be breathed in), ozone, lead and benzene (a carcinogenic).

The basis for the declaration was the findings of the Scorgie report (Scorgie, 2004). Scorgie had produced the first comprehensive report on air quality in the area in 2004. It was based on available information which, she warned, was far from complete, mostly not independently validated (in other words, industry figures are simply accepted) and often dated. The report is thus likely to *understate* the health impacts, rather than overstate them. Scorgie lists a total of 58 polluting industrial and mining activities and the top polluters for particulates, sulphur dioxide and carbon dioxide are ranked in Table 2 based on information that dates from 2000. The Vaal Triangle totals at the bottom of the table include emissions from all the industries listed by Scorgie (Scorgie, 2004).

Table 4.1: Top industrial polluters in the Vaal Triangle in 2000. With permission from groundWork Report 2006, "Poisoned Spaces". Compiled from Scorgie 2004. Emissions given in tonnes per annum (tpa).

Particulates (PM10) / tpa		Sulphur dioxide / tpa		Carbon dioxide / tpa	
ISCOR Vanderbijlpark	8,990	Eskom Lethabo	219,868	Eskom Lethabo	21,920,000
Eskom Lethabo	8,150	SASOL SCI	33,061	SASOL SCI	7,100,000
ISCOR Vereeniging	8,046	ISCOR Vanderbijlpark	23,203	ISCOR Vanderbijlpark	6,244,000
SASOL SCI	6,618	SASOL/Total Natref	19,144	SASOL/Total Natref	3,076,950
Vaal Triangle Totals	43,040		298,624		38,565,422

Other big pollutants are nitrogen oxides from all the big plants and hydrogen sulphide from SASOL's coal based processes. SASOL is South Africa's biggest source of volatile organic compounds (VOCs) while Mittal also emits significant amounts but does not report them. VOCs include a heady range of chemicals which evaporate easily into the air

and most of them are highly toxic. Sasolburg Air Quality Monitoring Committee (SAQMC) activists, using low tech 'bucket' sampling, revealed some 16 different VOCs in Zamdela's air in 2000. Several of these compounds had not previously been reported in South Africa. Samples showed dangerously high levels of benzene and high levels of toluene and xylenes at some sites.

Scorgie calculated that, as a result of pollution, around 11 600 people in the Vaal would be admitted to hospital with respiratory problems (problems serious enough for hospital admissions), 90 people would be admitted every year with cardiovascular (heart) problems, 25 premature deaths would occur every year, 24 000 people would suffer from chronic bronchitis and in a year the pollution would result in around 78 750 restricted activity days (9 days per year per economically active person). The direct health costs associated with inhalation exposures to PM10 particulates (particulates small enough to get into the lungs), SO_2 and NOx would add up to around R289 million per year. However, this does not count indirect costs or cases difficult to identify, e.g. leukaemia from exposure to benzene, which are no less real or expensive.

Scorgie shows that industry emits 90% of total air pollution in the Vaal Triangle. Much of it is emitted from high stacks claimed to reduce the local impact. During winter, however, temperature inversions trap pollutants in the lower atmosphere, creating a visible brown haze, and down-drafting brings the pollution down to earth. Most high stack emissions in fact come to earth within a 10 kilometre radius. Particulates from Mittal and VOCs from SASOL are emitted close to the ground while dust from coal, slag and ash heaps blows across neighbouring settlements. Spontaneous combustion at New Vaal Colliery results in repeated fires at ground level, emitting the full range of pollutants without abatement.

Throughout the Vaal Triangle, people complain of itching eyes and burning mucous membranes whenever the wind is in their direction. Zamdela, across the road from the SASOL One chemical plant and downwind of it, is particularly hard hit. Even following SASOL's conversion to gas, the air has a sharp chemical smell and people complain of

constant headaches. Metal pollutants are a growing area of concern. Samancor releases manganese to the air. Mittal releases manganese, chrome, iron and other heavy metals. Coal also contains trace metals including mercury which is highly toxic even at very low levels of exposure. Mercury is present in minute proportions but the massive scale of coal burning by Eskom, SASOL and Mittal makes it significant. Incidents – fires, explosions, leaks and flaring – occur with alarming regularity at many South African plants. As well as adding to the overall burden, incidents produce pollution spikes that result in intensive exposure. Even where the duration of such exposures is limited to a few minutes, the impacts on people's health are often severe and can be long lasting. Moreover, successive exposures have a cumulative effect which comes on top of the background exposure from normal operating emissions.

Conclusion: The Vaal Triangle and the MEC

The Minerals Energy Complex extended into most of Southern Africa, and played a crucial role in the creation of a South African state. The history of the MEC in the Vaal Triangle, and the industrial, polluted and political landscape it created on the Vereeniging coalfield, forms the material basis of our description of a pollution machine at work in Steel Valley. This history resulted in extensive pollution, normalized as a cost of production and growth. The Vaal was crucial in the early industrial growth strategy of South Africa, after World War II, and was formed by the surplus power of apartheid, which allowed not only subjugation of black labour, but also excluded discussions or rendered fruitless any complaints against its behaviour. It's a classic instance of the "treadmill of production" (Schnaiberg, 1980). This treadmill effected a transformation of the landscape from subsistence agrarian and hunting in colonial times, which also created the knowledge that formed the basis of colonial transformation, into a polluted industrial area. The resulting pollution has profoundly transformed the landscape through coal mining, the erection and operation of power stations, steel production, chemical and energy products. The area was also deeply marked by an apartheid spatial order. As a result of its role in the industrial economy, the Vaal Triangle experienced huge flows of

raw materials into the area, much of which remained in the area as waste or as diffuse pollution.

In this situation of surplus power, there was no space for civil society, little scope for regulation, little if any discussion, and strict control over information. This discursive space allowed for intense and unquestioned pollution, of both the Vaal River and the Vaal Triangle's Air over more than four decades. This history also created the building blocks – by provoking organized resistance - from which VEJA was eventually built (see chapter 9), as the EJ response. The pre-existing struggles against apartheid predisposed Vaal residents and activists to take on the EJ framework as it developed in SA, in a process analogous to EJ developing out of the movement for civil rights in the US. During this time, the political discursive resources of the communities were built up, and in same way as in the US, a basis for Environmental Justice built up. These resources flowed into the liberation movement and became part of its repertoire of human rights as it took over in 1994, established a new democracy and re-established the legitimacy needed to run the country. It included the environmental right in the constitution.

The MEC at work on the Vereeniging and associated coalfields can be viewed as a basic pollution machine. Its strategic aim was the exploitation of mineral resources in Southern Africa, and by extension building an industrial economy on this basis. The ISCOR factory in Vanderbijlpark built up not only a physical production – and pollution – infrastructure, but also a culture of imposing its power on neighbours and government regulators. This history is presented in detail in the next chapter. Apartheid played a major role in shaping the pollution machine. Under apartheid, industries like ISCOR, parastatal or private, operated without the threat of public discussion of their pollution, or any recourse against that pollution. The consequences on the environment and people living in it were extreme. The next chapter focuses in on the available evidence of pollution from the ISCOR steel factory.

Chapter 5: Pollution from ISCOR's steel mill

Introduction: Pollution practices and knowledges

A dispositive analysis reconstructs knowledge that is built into discursive practices, non-discursive practices and the materializations they create (Jaeger, 2001). In this chapter the focus is on understanding the knowledge that enabled the very material pollution practices from the steel mill until 1994 that lie at the core of this case study. Steelmaking is a well-known process, and so is the pollution that results from it. A reasonable knowledge of steelmaking and its pollution can be gained from material on the internet, for example Wikipedia. In addition, knowledge of this pollution is quite old, dating back to the nineteenth century in the case of acid rain in the German Ruhr area (Schaier and Stemmrich, 1997). Some of the pollution concerns in this chapter are already discussed in Kemmer (1971).

Steel workers and their families witness and often understand in detail the processes and the effects of steelmaking on their health. This perspective is highlighted in this chapter through a number of extracts from Devra Davis, an environmental oncologist who grew up in an American steelmaking town, Donora, itself the victim of intense pollution and an infamous smog incident described in her book *When Smoke Ran like Water* (2002). Her descriptions come from professional knowledge embedded in personal experience.

The first part of this chapter explains how steel making pollutes by giving an overview of the pollution and then traces the different processes involved: coke oven operation, iron making, the different types of steel making furnaces, rolling mills, pickling processes and galvanising, and the formation of slag heaps. Attention then moves to the pollution history of the Vanderbijlpark steel mill, based on information that came into the public domain during the first forum processes starting in 1997. This information reflects processes and decisions by the Department of Water Affairs. We consider the minutes of a meeting in 1961, which illustrate the level of knowledge of water pollution that ISCOR

had even then, as well as the nature of the relationship between the polluter, as parastatal, and the regulator. Over the following years, consultants to ISCOR as well as DWAF officials repeatedly brought signs and evidence of pollution to the attention of the operators of the steel works, and also the regulator, since these reports were contained in an archive in DWAF. These reports, considered in detail below, show that a huge amount of information on ISCOR's potential and actual pollution was in circulation, albeit only in small, privileged circles that, it will be argued below, worked with ISCOR in allowing the pollution. They also show a pattern of lax regulation, exceedances and breaking of permit conditions, known and ongoing pollution without significant consequences for the polluter. The final section considers what pollution the steel mill would likely have released towards its neighbours living in around 600 smallholdings.

Fig 5.1 ISCOR's Vanderbijlpark Steel Works. Picture: Stefan Cramer

Pollution from steel making

Modern steel making takes place on giant scale. It involves the movement of millions of tons of raw materials, large volumes of water and large amounts of electricity, resulting not only in the finished product, but also huge quantities of waste, pollution to the air and to water ways. At the Vanderbijlpark steel works "ores, chemicals, coal and equivalent energy sources are brought in on a scale of millions of tons per annum". It produced 2.2 million tons of solid waste annually, one million of which was classifiable as hazardous (Whitcutt, undated, unpaginated).

Steel making is highly visible and polluting. Steel making does not only pollute the air and water chemically, but adds to global warming through its intense energy use (O'Neill, 1993). The World Steel Organisation website declares that climate change is a crucial issue for the global steel industry and explains: "On average, 1.9 tonnes of CO2 are emitted for every tonne of steel produced. According to the International Energy Agency, the iron and steel industry accounts for approximately 4-5% of total world CO2 emissions" (http://www.worldsteel.org/publications/position-papers/Steel-s-contribution-to-a-low-carbon-future.html, accessed 30 October 2012).

Three main types of pollution are produced: solid waste in large quantities, air pollution from the hot and gaseous processes as well as dust, and water which is polluted as it is used for cleaning, cooling and scrubbing gases. Various surface wastes are washed into the water during rain storms. The raw materials of iron ore and coal used in steel making contain substantial impurities, which are removed and discarded as gas through smokestacks, in liquid form or as solid wastes. Polycyclic Aromatic Hydrocarbons (PAHs) and other Volatile Organic Chemicals (VOCs) arise from processes using coal. Many of them are known or suspected carcinogens, including benzene and toluene. The iron ore, and increasingly the scrap metal used in steel making, also contain many impurities: iron ore contains manganese, traces of heavy metal (cadmium, lead, zinc,

mercury, and others) and sulphur, while scrap is predominantly contaminated with tin, lead and copper, but also with plastics and paints.

Altogether, more than 100 chemicals are known to be emitted by steel mills. Research in in Ontario, Canada has shown that this cocktail not only affects all life forms around the mills, but goes down to the genetic level with hereditary DNA damage reported around a particularly polluting mill in Hamilton Harbour (Somers et al, 2002). Emissions of sulphur dioxide and dust from some integrated works can have a significant negative impact on local air quality. Sulphur and nitrogen releases from the sector make a substantial contribution in terms of acidification (acid rain). In addition, waste can escape from the works not only as air pollution, but as effluent in the water, in storm water run-off during heavy rain, and through water and wind from open slag heaps. To illustrate the range of pollution, and to show how generally available this information is, the following table summarises the main pollutants arising from the steel making process (www.wikipedia.org/Steel_mill). A detailed discussion follows below.

Table 5.1 Potential releases of pollutants during steel making. Wikipedia.

Steel making process	**Most significant potential releases of pollutants during stages in the process of steel making**
Coking plants (where coal is made into coke)	Release particulates, sulphur dioxide, nitrogen oxides, raw Coke Oven Gas, benzene and PAHs to air; oils and wastewaters containing phenols, cyanides and ammonia.
Blast furnace iron making	Releases iron fumes (particularly if no cast house fume abatement), carbon monoxide, sulphur dioxide and carbon dioxide to air; and waste water containing iron and heavy metals. Bleeder openings can be noisy and release carbon monoxide and particulate.
Basic oxygen steel	Releases iron fumes, heavy metals and carbon monoxide if they escape

making.	collection; and carbon dioxide
Electric arc steel making.	Releases iron fumes, other metals, PCDD/F and carbon monoxide into air; waste water; fume dust to landfill; and noise
Reheat furnaces and on-site power plants	Release sulphur dioxide and nitrogen oxides, particularly when burning fuel oil and large amounts of ash in the case of coal-fired power plants.
Sinter plants (which produce pellets of iron)	Release particulates, heavy metals, sulphur dioxide, nitrogen oxides, carbon dioxide and polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans (PCDD/F), which are carcinogenic.

Making iron and steel

An overview of the steel making process will make it clearer why pollution arises, and what types of pollution are possible.

Steel is a metal alloy of iron and carbon. The iron, which is found primarily as an oxide in the Earth's crust, is first heated to very high temperatures with large amounts of coal, which separates the oxygen from the iron. A flux, such as limestone or dolomite, is used to absorb – like "a kind of chemical sponge" (Davis, 2002: 10) – the impurities and unwanted chemicals like sulphur, and carry them off in the slag. To make steel, the iron is heated with coal and flux again, but this time the idea is to absorb some of the carbon (in a proportion of about one to a thousand) into the resulting alloy, which is left to cool under carefully controlled conditions to fix the amount of carbon it will contain. Other materials are often added to the iron-carbon mixture to give the steel special properties. Nickel and tungsten add strength and chemical stability, chromium increases the hardness, and vanadium reduces the effects of metal fatigue. Lead makes steel more pliable. If large amounts of chromium and nickel are added, a hard oxide forms on the metal surface, known as stainless steel. Zinc is used to coat or galvanize steel so it

doesn't rust. These are toxic heavy metals that can escape from the manufacturing process and end up in the surrounding environment.

To get enough heat from the coal, it first has to be transformed to coke in a coke oven. This is a dramatic operation, as Davis describes it from growing up in a steel making town:

> "A coke oven in 1950 was a pretty simple affair, a gigantic beehive about the size of a one-car garage, built in honeycomb-fashion out of fired bricks. Coal was shovelled in, and heated to intense temperatures; coke came out. The gases and smoke that were baked out of the coal were supposed to remain completely in the oven, but they did not. Seductively sweet aromatic hydrocarbons filled the air and ground nearby.
>
> "A coke battery… had to run all the time, at temperatures above 2000 Fahrenheit . The ovens had to be blocked to ensure a constant, even temperature…. Once the ovens were fired, hardy souls with a good tolerance for heat had to carefully stack bricks together over the opening to keep the temperatures up. Folks who worked the ovens tended to be young".

When the coke was ready:

> "The oven doors would be opened on both sides, letting air into the chamber. In an instant, the air starved coke sucked up oxygen and exploded with spectacular flares. Massive amounts of water were needed to quench the flames. Just like steel making, coking use(s) thousands of gallons of water every day…
>
> The water used in steel making tends to pick up whatever impurities that are rinsed off materials in the process. Some bright fellow had the idea of using dirty water from other parts of the mills to quench the coke, which made sense except that however poisonous the water was when it came from the mill, it would only be made worse by quenching. Mrs LaMendola told me she could never get tomatoes to grow in the path where the plume from the ovens ran. On the other side of her house, they did just fine" (2002: 11).

According to Down and Stocks (1977), coke ovens produce highly toxic tars containing phenols, cresols, naphthols, acridine, pyridine, among others. The gas created by heating the coal is led off to the coke by-products plant where ammonia, benzene, xylene, toluene, phenol and naphthalene can be recovered. During recovery, the gas is sprayed with water producing flushing liquor. "This represents a very difficult pollution control problem," according to Kemmer "since the liquor is very high in ammonium chloride… and contains such other contaminants as phenol, cyanide and thiocyanates" (Kemmer, 1971: 10).

ISCOR installed its first coke ovens in the 1950s, as well as by-product plants, which have been operating ever since, although a number went out of commission, as others were added over the years (Prinsloo, 1993). As will be shown below, the effluents contaminated by the coke ovens have over the years proved difficult to handle. In 2004, Mittal VDB reported the waste coming from its coke ovens as 70 000 tons per year of crude tar, 2 400 t/a of tar sludge, 4 000 t/a of ammonium sulphate and 180 000 t/a of coke breeze, which are fine coal particles (Ispat ISCOR, 2004).

The iron input into steel making can go through different processes before it is ready for steel making. Traditionally, blast furnaces – which are huge steel stacks lined with refractory brick - are used to change iron oxides into liquid iron. A mixture of iron ore, coke and limestone are dropped from the top of the stack and descend through blasts of hot air to the bottom over a period of 6 to 8 hours. Very high temperatures result. At the end of the process, the liquid iron is tapped through one hole. The slag (the limestone or dolomite with the impurities it absorbed), which is lighter and floats on top, exits through another hole. While gas is caught and cleaned by special pipes, some of it is vented to the air, or burnt as waste. Unintended and unwanted by-products, like the dangerous dioxins, are released, together with sulphur dioxide, carbon dioxide and carbon monoxide. Breathable particles can also be released. In 2004, Ispat ISCOR reported producing 28 700 t/a of (iron) dust, 13 000 t/a of gas cleaning sludge, 600 000 t/a of granulated slag and 36 000 ton of blast furnace slag from its (two) blast furnaces. The iron dust and gas

cleaning sludge are recycled to the sinter plant, and slags used in the cement industry and for road construction (Ispat ISCOR, 2004).

A sinter plant prepares sinters, which are pellets of iron ore and coal, for feeding into furnaces. Scrap steel is another form in which iron can be fed into the furnaces. In a more recently invented process, direct reduced iron is produced by processing iron ore and coal in Direct Reduced Iron (DRI) furnaces.

At ISCOR Vanderbijlpark (Fig 5.1), steel is made in both Basic Oxygen Furnaces (BOFs) and Electric Arc Furnaces (EAFs). In the Basic Oxygen Furnaces, almost pure oxygen is forced via water-cooled oxygen lances into the steel bath at supersonic (and ear-piercing) speeds to drive impurities off the molten steel. This process liberates more heat inside the vessel, which melts the added scrap. Six storey high buildings are needed so that the huge oxygen lances can be manoeuvred around. Fluxing materials are added to carry off chemicals not wanted in the steel – like sulphur and other impurities. In the process iron fumes, carbon dioxide and large amounts of carbon monoxide gases are released. Gases escape during charging and tapping the furnaces. Water is used for scrubbing gases of dust and fumes. Another environmental challenge is large energy losses during the process. Another childhood memory from Davis (2002: 12):

> "On summer evenings, my family and I would sit in lawn chairs behind our house and watch the fiery spray of what was called *kish*. Brightly burning graphite spewed off the ladles that drew hot iron from the furnace and burnt like gigantic, brilliant sparklers. Each minute of the day all year long five vertical engines sucked in 42 000 cubic feet of gas. When burned through a single stack atop the furnace, the gases plus lots of reddish iron ore and other dusts flamed at night like a rocket's tail. The spectacle was dazzling."

ISCOR Vanderbijl Steel (IVS) reported in 2004 that its BOFs produced solid waste consisting of 12 000 t/a of iron dust, 45 000 t/a of desulphurisation slag and 504 000 t/a of furnace slag, which was dumped. Other solid wastes – 36 000 t/a of mud, 8 000 t/a of grit and 36 000 t/a of furnace slag - was reused internally (Ispat ISCOR, 2004).

In the Electric Arc Furnaces (EAF), an electric arc sprung between two giant, flexible electrodes provides the bulk of the energy to melt the scrap and prepared iron ore. Oxygen is lanced into the molten steel in this operation as well. EAFs can produce low-carbon steels or ferroalloys which are used in the production of ferromanganese, ferrovanadium and ferrochrome. The fluxing materials, as in the blast furnaces, carry off chemicals not wanted in the steel, like sulphur and other impurities. EAFs "cause a rather high discharge of dust to the atmosphere" (Kemmer, 1971, 10-11). Wash water also picks up very high levels of suspended solids. IVS reported in 2004 that its EAFs produced dust of 16 000 t/a which had to be disposed of, and 100 000 t/a of furnace slag, which was reportedly reused internally (Ispat ISCOR, 2004). In 2006 and 2007, during research for this study, the author regularly noticed a cloud of red dust escaping through roofs next to Delfos Boulevard, by midmorning.

When the steel is tapped from the furnaces, it is rolled or cast into intermediate and final forms at the hot or cold roll mills. In the rolling mills, water picks up oils and lubricants. As a finishing touch, steel forms are treated in acid baths – with sulphuric or hydrochloric acid – to remove oxide (rust) from the surface to prepare it for coating or galvanising. This is called pickling. The spent pickle liquor is strongly acidic with scales suspended in it. The forms are then coated in zinc or other substances at high temperatures, releasing fumes and heavy metals. Davis, a medical doctor, is intensely aware of what the health implications in her home town were (2002: 14):

> "Working zinc was like working coke, only worse. The zinc furnaces were so hot that you could see heat rising from them in rivulets of distorted light, like fun-house mirrors. At its peak, the Donora Zinc Works employed about 1,500 men, who enjoyed an average workday of just three hours and yet received the highest wages in town – this in an era before unions had entered the plants. There was some difference of opinion about why this was. The workers themselves used to say that they were so efficient that they could fill the ovens within three hours with as much material as could be processed in an entire day. Lynn Snyder, a historian who studies the town's pollution, maintains that zinc workers worked a three-hour day because nobody could have tolerated more time than that in front of the red-hot furnaces."

Most steel works – including Vanderbijlpark – build up a huge slagheap as not all slag can be recycled. Slag heaps typically present dust problems. In addition, rain percolates through slag heaps, leaching minerals from the slag and into watercourses or underground water. As slag is the result of processes removing impurities in the furnaces, these impurities can again be leached from the slagheap. Slag heaps also present a temptation to managers and workers to bury other waste materials inside (see fig 9.2).

An ISCOR pollution history

ISCOR, as a parastatal until 1989, enjoyed a special relationship with the regulator, as both were parts of the state. As a result of the 1956 Act, which became operational in 1959, ISCOR had to apply for a permit to discharge its polluted effluent. At that time, there was no public opposition to the pollution, and no urgency to legitimate it. However, a system of environmental management and of regulation was in place, consisting of a sampling, monitoring, analysis and reporting system, resulting in a knowledge of the waste streams in the works. This knowledge was used and extended in consultants' reports and interaction with the regulator. This process could be seen as a forerunner of the pollution dispositive.

The following information comes from an archive of correspondence between DWAF and ISCOR. This was first read by Carin Bosman, in the course of her duties as official responsible for the Rietspruit catchment (personal communication, September 2009, see chapter 8 for more detail), then it was tabled in the WGCS/ISCOR Pollution Forum in 1997, after which it was used in the Johnny Horne court case. Now extracts from it are used in this study. It is an example of discursive resources that are used by readers other than those they were originally intended for, or moving across contexts (Blommaert, 2001).

It is worth reviewing the start of "environmental management" in ISCOR as it is detailed in the proceedings of the steering committee of 1961 (DWA Minutes, 1961, July 25) as this shows the formative conditions of the relationship between the polluter and the regulator. The committee was appointed by DWA as one of the conditions in ISCOR's first permit of exemption. ISCOR received a permit of exemption (from the stricter standards that applied generally), on condition that its compliance to its permit conditions would be monitored through a steering committee comprising the Department of Water Affairs, the SA Bureau of Standards, the Water Institute of South Africa and ISCOR itself (DWA, 1961, 7 March, Permit No. 79B).

Regulation by committee, 1961

This section will argue that this committee meeting established a number of patterns that came to characterise the regulation of ISCOR's effluents:

1. The exchange of shared but secret or "confidential" professional knowledge.
2. Negotiation of standards that are lower than those legislated, in the form of "exemptions".
3. Agreement that the committee would not interfere with ISCOR's production processes, therefore limiting the committee to "end-of-pipe" solutions.
4. Pollution control is decided on the basis of what is economically feasible.
5. ISCOR would deal directly with complaints from the public about its pollution.

The permit included the right for DWA officials of "entry to the purification works at all reasonable times for the purpose of taking samples of the effluent at any stage of the purification process" (DWA, Permit No. 79B, 1961, 7 March: 2).

The first meeting of the Steering Committee took place in July 1961, and is also referred to in the Consolidated Heads of Argument, Vol 3 of CASE NO 00420/01 (High Court of South Africa, Case no 00420/01, 2001). The proceedings at that time were marked confidential. The terms of reference excluded any interference in the manufacturing

processes. The committee also agreed that, unlike other Works steering committees (appointed by DWA), this committee would not reply to complaints, but allow ISCOR to respond to complaints directly (DWAF, 1961, July 25). If ISCOR so chose, it could refer these complaints to a technical subcommittee. This meant that ISCOR had developed its own system for responding to public complaints very early on. By acceding to this arrangement, DWAF removed itself from the picture. It was no longer an interface between public and ISCOR but left that to ISCOR.

These minutes show detailed discussion and measurement of effluent composition, which shows that ISCOR and the regulator had detailed knowledge about the pollution. According to Mr Heynike, DWA's water treatment officer,

> "The evaporation pond method of effluent disposal constituted a serious threat as regards:
> (a) Contamination of underground water supplies by nitrates
> (b) Ruination of adjoining farmlands for agricultural purposes due to the elevation of the ground water table, sub-surface seepage and salt enrichment" (DWA, 1961, July 25: 3)".

ISCOR proposed

> "emergency measures aimed at the reduction of the load on the evaporation dams by allowing the discharge of part of the noxious effluents, after treatment, with the normal slightly polluted works effluent into the Rietspruit" (DWA, 1961:3).

For a permanent solution, ISCOR had in mind to release biologically treated effluent from the Coke Ovens into the Vaal River, either before or after the Barrage. They also wanted the committee to consider a pipeline for taking effluent to the Vaal below the Barrage. The committee agreed that Cold Mill effluent, after treatment, as well as effluent from the main seepage drain could be released into the Rietspruit canal. This was the water in which Lulu Geldenhuys (see chapter 7) and other children of Steel Valley would swim in for years. The minutes note that after the decision, the committee had a lunch

from 1 pm to 2.45 pm, stopped the meeting at 3 and conducted a site visit of the evaporation dams, the seepage drain and the Rietspruit (DWA, 1961).

In further meetings, ISCOR agreed to submit quarterly reports. Over the following years, consultants to ISCOR as well as DWAF officials repeatedly brought signs and evidence of pollution to the attention of the operators of the steel works, and presumably also the regulator. What follows below are extracts that show a minimum of what both the regulator and ISCOR would reasonably have known about ISCOR's pollution, presented as heads of argument in the court case: *High Court of South Africa, (2001): Case no 00420/01, In the matter between Matsepe et al vs. ISCOR Ltd.*

The examples that follow can be argued to show a pattern of lax regulation, exceedances and breaking of permit conditions, known and ongoing pollution without any serious consequences for the polluter.

Evaporation dams leaking into groundwater, 1974 and 1975

In 1974, ISCOR investigated the permeability of the soils below the dams in two reports. While the first report indicated "low permeability" of soils, a second report in the same year (Vandenbon 1 and 2, 1974 cited in High Court of South Africa, 2001) revealed that the underlying rock was very fractured and held so much water that some boreholes caved in during drilling. In 1975, engineering consultants were called in to investigate huge water losses from effluent dams 1 and 2 - approximately 20 000 cubic meters over 50 days (Wiid, 1975, cited in High Court of South Africa, 2001). It seems reasonable to conclude that this water, with its contaminants, had been lost to the underground aquifers.

Tar with strong phenolic smell, 1979

The records show that both DWAF and ISCOR knew, at least since the 1961 technical committee, referred to above, that coke oven effluent was going into the evaporation

dams, containing a series of dangerous hydrocarbon products. In 1979, it was reported that an official of the Soil and Irrigation Research Institute found a soft tarry deposit on the bottom of the dam. The effluent itself was described as "dark coloured and had quite a strong phenolic smell" (High Court of South Africa, 2001: 21). This indicates that aromatic hydrocarbons had accumulated at the bottom of the dam as and were likely to be seeping into the ground water in the form of DNAPL (Dense Non Aqueous Phase Liquid) or tar.

Evaporation ponds are a problem, 1983

In April 1983, the engineering firm of Steffen, Robertson and Kirsten (SRK) carried out a borehole census in the area around the works. It found that the water quality deteriorated in proximity to the western boundary of the Works. It identified the Evaporation and Maturation Ponds – huge dams in which effluents from the works were held – as potential pollution sources, found that seepage from the Evaporation Ponds was polluting groundwater down gradient to the west, that seepage from the Maturation Pond was polluting groundwater at depth as shown by the elevated levels of ammonia in the groundwater and predicted that the level of pollution would rise with the passage of time (High Court of South Africa, 2001, Heads of Argument).

Tromp's complaint in 1984

In August 1984, a sample from a borehole on Plot 66 Steel Valley analysed by the Peri-Urban Board was reported to have a strange smell and a very high dissolved salt content. It was unfit for human consumption (High Court of South Africa, 2001, Heads of Argument: 28). This was a confirmation by an outside agency of the effects of the Evaporation and Maturation Dams on the groundwater. The Department complained in a letter to ISCOR that several smallholdings at Steel Valley had become polluted to the extent that the groundwater was "neither suitable for domestic use nor garden irrigation". A departmental survey showed that plots closest to ISCOR were badly affected and that "there is a front of polluted groundwater which is advancing into the small holdings and

it is anticipated that more plots will be affected in the years to come." The Department called for a halt to the spreading of pollution and the provision of clean water to plot-owners "as their present supply is completely unusable" (High Court of South Africa, 2001, Heads of Argument: 28).

The complainant, resident on plot 66, was Mr J. Tromp. He threatened legal action. The matter was resolved by ISCOR offering to provide water to the affected smallholdings, without acknowledging responsibility. Pipelines were built crossing underneath the Golden Highway which separates the ISCOR works from Greater Steel Valley. To residents, this would have amounted to an acknowledgement of ISCOR of the open secret of its pollution, even if it stated that the water was being provided to the residents without acknowledgement of any fault on its side.

In August 1985, a parliamentarian (George Ballot of the National Party) reported that local inhabitants were "up in arms" about ISCOR's pollution (High Court of South Africa, 2001, Heads of Argument: 30). In a meeting in July 1986, ISCOR promised the Department of Water Affairs that:

- "the Maturation Dams and Irrigation Dams "will be replaced by the end of 1987"
- the Evaporation Dams will be phased out beyond the set date of 1989;
- efforts will be made to control water pollution from Slag Dump leachate
- surface water would be removed by the establishment of a green belt around the heaps and the western side of the dumps would be top-soiled and grassed" (High Court of South Africa, 2001, Heads of Argument: 30).

This did not happen and was tabled in the 2001 court case as evidence of a pattern of broken promises by ISCOR (High Court of South Africa, 2001).

Why is monitoring of groundwater not adequate?

A second SRK Report, in January 1988 (in High Court of South Africa, 2001), complained that the number of boreholes for the monitoring of groundwater was not adequate to properly define the characteristics of the groundwater. It expressed the opinion that it is "likely that a number of harmful organic constituents which can be either carcinogenic or non-carcinogenic are present in significant concentrations" (High Court of South Africa, 2001, Heads of Argument: 32). It said that ISCOR's wastes were characterised by "high concentrations of total dissolved solids, chlorides and sulphate. The northern Evaporation and Maturation Ponds and the BF (Blast Furnace) and Sludge Dams also have high ammonia concentrations" (High Court of South Africa, 2001, Heads of Argument: 32). Again, it was pointed out that ISCOR was vulnerable to legal action under the common law irrespective of whether the Department chose to prosecute ISCOR or not. They also pointed out that the southern Evaporation Dam not only provides "a significant source of contaminants relatively close to the boundary of the property" but that its presence has also led to the "development of a shallow water table in this area". It noted that pollution noticeably increased between 1982 and 1986 (High Court of South Africa, 2001, Heads of Argument: 33).

In its letter to DWAF accompanying the SRK Report, ISCOR said that it was doing research into:

- "biological treatment of the more toxic effluent products of the coke ovens followed by its use in blast furnace gas purification (thus allowing irrigation to be discontinued);
- concentration by distillation of effluent streams arising from demineralisation and water softening;
- the resultant concentrated brine to be stored in dams with an appropriate impermeable lining which would prevent the polluted concentrate entering the groundwater" (High Court of South Africa, 2001, Heads of Argument: 35).

What pollution was Steel Valley likely to have received?

The documents discussed above provides evidence that, within the closed circle of ISCOR management, the scientists that conducted investigations for them into their pollution, and the state as regulator, a huge amount of information on ISCOR's potential and actual pollution was in circulation. The information refers to risks of liabilities, public awareness and protest about the pollution from the neighbours of the steel mill. The next section considers the proximity of Steel Valley to the steel factory, and the likely sources and types of pollution.

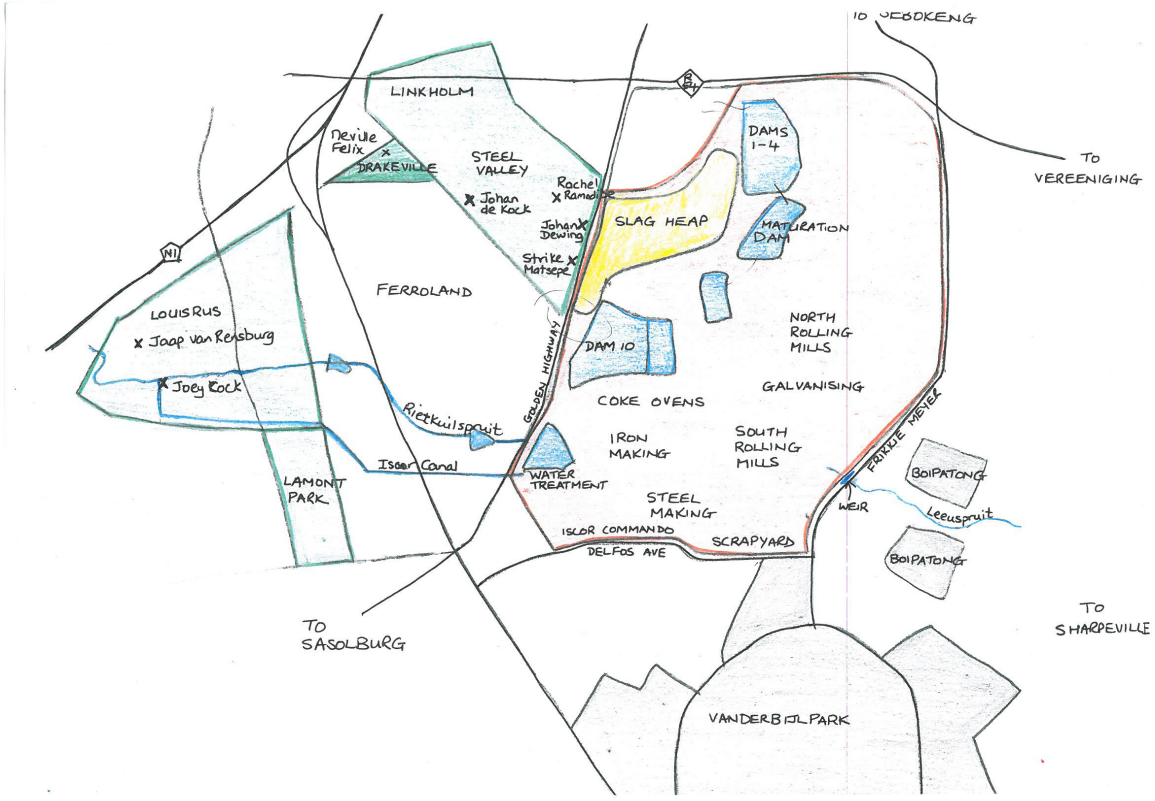

Figure 5.2 Steel Valley in relation to the Mittal Steel factory in detail. Map by Peta-Anne King.

As the maps (fig 5.2 and 5.3) show, the Greater Steel Valley is on the western side of the Steel Works, separated from it by the Golden Highway. Three areas in the works are of particular interest for this study, starting from the North.

The first are the evaporation dams which collected effluents from the coke ovens and other works for more than 50 years. These unlined dams are situated on top of permeable geological formations, as pointed out earlier, and leaked their toxic effluents into the groundwater. Since the groundwater geology is unpredictable, with so called finger zones, it is difficult to say where exactly the toxins went.

Secondly, the huge slag heap collected not only slag from the furnaces (limestone with impurities drawn off from ores and coke), but also various toxic waste e.g. from airbags and other cleaning devices, which were buried in the slag heap (see Fig 9.2). The slag heap had not been covered for many years, and during the research, dust could clearly be seen blowing from the heap. The slagheap is most directly opposite Steel Valley. It is particularly the first row of farms – home to Mr Tromp, Strike Matsepe and Johan Dewing - that were argued to be directly polluted (see Fig. 5.3).

Thirdly, the Rietkuilspruit is a natural waterway that enters ISCOR from Vanderbijlpark and exits to the West, carrying storm water and other contaminated water from the site through the Rietkuil farms. These farms now belong to the Steel mill. The Rietkuilspruit turns south to wind its way through Louisrus, in the middle of which it meets up with the Rietspruit canal. It is at this junction of the two waterways that Joey Cock and her daughter, Lulu Geldenhuys, lived and experienced the pollution. The title deeds for smallholdings along the canal included servitudes which entitled the owners to irrigate from the water in the canal, apparently then considered fit for agriculture. This canal carried process effluent from the steel works until 2006, when Mittal Steel built an up to date water treatment plant. Smallholdings on the canal had the right to irrigate with this effluent. Because there were no warnings that this water was dangerous, Louisrus children played and swam freely in this water. The Rietspruit canal and the Rietkuilspruit eventually join the Vaal River north of the barrage, at Loch Vaal.

It is difficult to specify exactly what pollution the Steel Valley residents were subjected to. This was a matter of considerable dispute. However, there was also a surplus of generally available information available, both about the pollution of steel making in general, and in bits and pieces that leaked out from the ISCOR strategy to keep their information secret. In addition, a large number of Steel Valley residents worked for ISCOR, and had insider knowledge of its processes and problems.

Figure 5.3 Strike Matsepe's house and smallholding directly opposite the slagheap. Photographer unknown.

DWAF official involved in the Rietspruit, dr Carin Bosman (more detail about her engagement in the issue follows in chapter 7), got involved in the ISCOR issue around 1994. She read through the available documentation, engaged with the issues and even after leaving the department, stayed involved with the case. She has developed a specific

view on the sources of pollution. According to her, the main pollution sources are the following (based on Bosman, personal communication, 2009):

1. The first source consists of the effluent and storm water from the Central Effluent Treatment Plant (CETP) and the area called "Siberia" because of the amount of surface pollution.

2. The second is the historic tar pits, which are now no longer visible. They were situated between the highway and the current slagheap. They probably caused the smells in the 1980s, and are probably the source of the volatile organics. In 1995, one Steel Valley resident living close to the historic tar pits, opened up a closed borehole, pumped it for 24 hours, and then "struck oil", because the heavy fraction DNAPL was in the tar pit. DNAPLs are extremely difficult to rehabilitate, as it travels via aquifer bottoms and crevices. DNAPLs contain PAHs which are carcinogenic. The light phase – LNAPL – could have caused disease. It is unknown how many of these tar pits there were and whether they were ever rehabilitated.

3. The third is the slagheap (fig 5.4), which is 40 m high and 110 ha big. It is a huge mass of slag. But it also contains other elements that now leach out into underground. There is almost direct hydroconnectivity between the slag dumps and the aquifers flowing to west and north. When Bosman drove around the area, in 1995, she could see salt crusts in Steel Valley gardens.

4. Bosman argues that there is also a physical effect of the slag heap. The weight of this heap pushes the shallow aquifer up, from about 6 metres, to 2 to 1 metres, which has the effect that septic tanks of the smallholders are flooded, which meant that the natural slow process of a septic tank did not take place, and nitrates entered into the borehole water. Nitrates are dangerous to young babies, and can cause tiredness in adults (O'Neill, 1993). A number of the people Bosman had talked to, mentioned the death of "blue babies". According to Bosman, ISCOR

argued that they could not be held responsible, "because they don't produce nitrates".

5. Fourth is Dam 10, sits at the back of the slimes dams. It was used to hold effluent from the coal tar plant, the phenols. Phenols cause mutagenicity, teratogenicity, and deformations at birth (Carson, 1962). According to Bosman, the fifth source is the so-called bird dams, dams 1 to 4, which received any excess water. There is an unofficial channel, between dam 10 and Voeldam, for overflow from dam 10.

The Master Plan Integration Report, a draft for discussion (OFT, January 2003) is particularly useful in answering the question of what pollution emanated from the IVS (ISCOR Vanderbijlpark Steel). It found that:

> "unacceptable impacts and potential risks to both human health and the environment beyond the IVS perimeter" had been caused by activities within the IVS works, opposite the TETP (the Terminal Effluent Treatment Plant), to the west from and opposite the existing waste dump, the redundant blast furnace sludge dams and dam 10; to the west and northwest of dams 1 to 4, in the Kiewiet area, and the area around the Frikkie Meyer weir, which drains into the Leeukuil (2003: 139).

The main source of water pollution was the Consolidated Residue Management Facility (CRMF), which received all the waste streams. The CRMF consists of the waste dump, dam 10, dams 1 to 4, the maturation ponds, the raw materials stockpile areas, the processed material storage areas, the Central Effluent Treatment Plant (CETP) sludge dams and the redundant blast surface sludge dams. The report provides a description of water pollution in the CRMF:

> "Rain falling onto the CMRF area becomes contaminated on contact with contaminated surfaces. Infiltration of this contaminated surface water into the ground has an impact on the quality of ground water, and also raises the levels of ground water" (2003: 35).

"The mechanisms for the hydro-chemical manifestation of ground water pollution relate to the generation of leachates as infiltrating water percolates through dumps, stockpiles or contaminated solids, or else simply through seepage of contaminated surface water, process water or effluents contained in dams and ponds into the ground water regime" (2003:33).

It reports that:

"Ground water chemistry results obtained from boreholes in the great CRMF area, confirm elevated concentrations of Ca, Mg, SO_4, Cl, K, Na, NO_3, F, Fe and Mn within both the perched and shallow weathered zone aquifers… " (2003:33).

"Organic ground water chemistry observed in the boreholes indicates the presence of both free phase and dissolved phase DNAPL (coal tar)…" (2003:33).

It then specifies the zone of impact:

"…it is especially the area to the west of the Existing Waste Dump and Dam 10, up to, and beyond the IVS western perimeter, which have been impacted. The lateral migration of contamination plumes is largely the function of the observed regional ground water flow patterns" (2003:33).

"The extent of the organic contamination in both the perched and shallow weathered zone aquifers includes localized areas within the CRMF and areas extending beyond the IVS perimeter. Contribution to the dissolved phase from residual DNAPL pools observed also occurs" (2003:34).

It considers the risk to human health and the environment:

"The risk to human health is represented by the exposure through the ground water pathway for drinking water application. The risk to the environment is represented by the exposure through the aquatic ecosystems pathway. The areas for which both these risks are generally unacceptable, relate to the footprints of the facilities/sources within the CRMF. Beyond these footprints, the risk to human health and the environment is

generally unacceptable in the area between these facilities and the IVS western perimeter, and also for a distance beyond the IVS perimeter" (2003:36).

"For both the aquifer zones, the risk to human health and the environment generally relates to elevated inorganic concentrations for Ca, Mg, SO_4, Cl, Na, K, NO_3 , F, Fe and Mn" (2003:36).

"The risk to human health and the environment for organics, relates to the entire observed free phase DNAPL pool as well as several organic components observed in dissolved phase in some boreholes within the CRMF" (2003:36).

"With regard to the more potent micro-contaminants, mobility of the impacted CRMF soils indicated a potential unacceptable risk (pathway being groundwater) of manganese to the environment, and a potential unacceptable risk of aluminium and iron to human health" (2003:36).

It weighs the difficulties of dealing with the pollution and makes recommendations:

"Due to the technical impracticability to remediate the observed ground water pollution within the CRMF to levels that will represent acceptable risk to human health and the environment, these objectives will have to be reached through institutional controls." (2003:37).

"The aquifer(s) impacted on by the Activities within the CRMF can generally not be remediated to acceptable risk levels through technical measures, over the short and medium terms. Such measures will require flushing of the aquifers with "clean" water and/or steam and will in any event take several decades to improve the situation significantly (2003: 38).

What this means in plain language is that the groundwater under the CRMF was so polluted that it would be difficult and expensive to clean it. With the above – and there is more detailed information in the summary report and the Master Plan – it can be concluded that extensive pollution affected the ground water below and beyond the steel factory, and that this pollution was dangerous to human health and the environment.

Conclusion: a treadmill of production

In the light of the evidence of pollution, given above, the Vanderbijlpark steel mill can be described as a classic instance of a physical treadmill of production, producing, as other steel mills do as well, from huge flows of raw materials, using big amounts of water and energy, and leaving behind huge heaps of waste and pollution. According the Executive Report on the Master Plan (dated July 2003), ISCOR annually used…

> "4,4 million tons of iron ore, 2,5 million tons of coal and 0,4 million tons of additive like lime, dolomite, fluxing agents, alloys and other minor components. From this, 3,0 million tons of cast steel slab (was) produced… (and) approximately 2,2 million tons of solid residue" (July 2003: 10).

It can also be argued that the production imperatives and knowledges were privileged at the expense of the impact knowledge and prevention (Schnaiberg, 1980).

Was there a pollution dispositive at work in Steel Valley before 1990? There is certainly evidence of a large role being played by the creation and circulation of knowledge, knowing what the pollution is, and making administratively supported, secret decisions about that knowledge. However, there was no public pressure to legitimate the pollution. The helplessness of citizens, including their government aligned political representatives, shows the very strong position of ISCOR in a situation of what has been described as "surplus power".

It is only in 1991 that contemporary forms of environmental management emerges, as alluded to in chapter 1 and explored in chapter 7. It is a response of the political and intellectual support structure of the Minerals Energy Complex (as identified in chapter 4) to a simultaneous demand for democracy and environmental responsibility arising in the 1990s. Environmental management is that strategic response. At its first emergence, it contains concepts of great tactical value: of a holistic or, from another perspective,

totalizing knowledge ambition, which creates the conditions for control over the production of pollution knowledge; in the concept of “absorptive capacity”, a view of nature, including water bodies, as a sink for industrial waste; and of the need to contain environmental and sustainability concerns with the broader framework of politically urgent “economic development”. With this response, a pollution dispositive starts to emerge. The Steel Valley struggle would escalate this response into an “urgency”.

Chapter 6: Community challenge and community meaning making

> "Iron and zinc are in the water we drank. Arthritis is the thing that bothers me the most. I asked my mother to take a pistol and shoot me because I couldn't take the pain anymore. I have sores that break open and stink just like the polluted canal water."
>
> Wimpie Cock, Steel Valley (Interview, 2005).

Introduction: community discursive strategies

This chapter will show that Steel Valley residents used a variety of tactics in their struggle against the pollution. They worked together, crossing racial divisions inherited from apartheid, to challenge the polluter via the institution of local government. They participated in multistakeholder forums, first under the auspices of the local government structures where they played a dominant role, then in a forum between this local government and the polluter, and then in a forum instituted by the state through the Department of Water Affairs and Forestry (DWAF). They enlisted scientific expertise, e.g. through the Water Institute of Southern African (WISA). They gained strength from a whistle blower. They challenged ISCOR in two court cases. They interacted intensely with the media. In the 2003 license application, they participated robustly and stated their case forcefully. Even after the buy-out, some residents continued their activism. The Steel Valley Crisis Committee (SVCC) joined with other polluted communities in the Vaal Triangle to create the Vaal Environmental Justice Alliance (VEJA), described in chapter 9. From VEJA, they became part of an active international network challenging the ArcelorMittal pollution worldwide. As an individual Johan de Kock pressed ahead with his constitutional court challenge, despite many difficulties.

During these efforts, they created discursive resources, accessed discursive resources, and entered discursive arenas with varying levels of success. The community had strong perspectives on the existence of the pollution. Taken together**,** their descriptions made up an account of the cost of the externalities imposed on them by the pollution. Descriptions include changes to the landscape of Steel Valley, effects on people's bodies, on their farms, crops and livestock, and therefore their livelihoods, as well as the losses they suffered in terms of community life and amenities. All these elements can be seen in the narratives that were collected during fieldwork in Steel Valley.

Their narratives also included proactive elements. One resident compiled a "cancer map" – mapping occurrences of cancer in the area and claiming that it showed an incidence that was far above average in the country (Jaap van Rensburg, interview 2005). Residents worked together, as will be shown below, in compiling a vision of an alternative, which also contained all the elements that needed to be replaced to allow the community as a whole and re-establish itself elsewhere. Their view of a remedy included compensation for loss of livelihoods, health, community as well as future threats to their health. Their descriptions were based on practical experience and the immediate necessities to make a plan to continue living by taking care of their health.

In this chapter, two aspects of discursive power are brought into focus: the creation of discursive resources through processes of "community meaning making"; and how the community used these resources, as well as other resources that they could access, in their quest for Environmental Justice. The next section provides background on the Steel Valley community and their circumstances before and during their struggle with the pollution. It then explores a number of examples of how Steel Valley residents made meaning of their experiences, and how they used the discursive power that they created for themselves. It ends with a discussion of the effects, and limitations, of this type of discursive power in the situation in which they found themselves.

ISCOR had never been challenged before, and the discursive resources that Steel Valley managed to create and access were remarkable, as shown in this chapter below.

Nevertheless, the Steel Valley community was defeated in their immediate aims, which brings into view the pollution dispositive, a complex of interests, agendas, historical momentum, power imbalances, unspoken alliances and calculations that all added up to a single result: the promise of a right to a healthy environment was not fulfilled. The Steel Valley challenge however, was not simply a defeat. The challenge forced both the polluter and the regulator into a series of legitimation exercises that resulted in the creation of a fully developed pollution dispositive, stronger regulation, strengthened the Environmental Justice movement and created an ongoing and very public battleground about pollution.

Greater Steel Valley and small farms in the Vaal

Steel Valley consisted of around 600 smallholdings or "plots" as they are colloquially known. They were situated to the west of the ISCOR steel mill, across the "Golden Highway" (see figure 5.2). Greater Steel Valley consisted of Steel Valley, (which had 69 plots) Linkholm, (108 plots) Drakeville, (14 plots) Louisrus (21 plots) and Rietkuil (178 plots). Other affected areas were parts of Lamontpark and Rosashof. Title deeds show that the Greater Steel Valley (GSV) came into existence at roughly the same time as the steel mill, in the early 1950s.

Smallholdings, defined as a piece of land smaller than 2 hectares but bigger than a regular *erf* or yard in a town or city, are a particular feature of the landscape mostly around big South African cities. Most of their development took place at the time of early industrialisation in the first half of the twentieth century. They provided for people who loved rural life, who wanted to be free from municipal restrictions, farm on a small scale or conduct a small business. More than half of smallholders have regular off-farm jobs (Prinsloo, 1993). This was true for Steel Valley too, where most people worked for ISCOR.

In the late 1950s, at the time that GSV was established, government concern was growing about smallholdings as an inefficient land use on the urban fringe since they were neither agriculturally productive (and except in rare cases not economically viable), nor an efficient form of urbanisation, since they were not dense enough to provide services efficiently. They also escaped municipal regulation, leading to fears among apartheid bureaucrats that they would be used for illegal black housing (Prinsloo, 1993). Urban residents – like the ISCOR management - referred to smallholders with the derogatory term *"maplotters"* (a mixture of Afrikaans and Sesotho) a label which allowed ISCOR to disregard many of their concerns (Van Eeden, informal communication, 2009). In the Vaal Triangle, before 1994, more than 80% of smallholders were Afrikaans speaking (Prinsloo, 1993). They were also politically conservative. According to Neville Felix, who moved into Steel Valley in 1989 from District Six, most of his neighbours were heavily armed, fearful of the political transition after apartheid and suspicious of his darker skin colour (interview, April 2005).

The greater Steel Valley area was a well-established farming and residential area, of between 500 and 600 smallholdings. A 1998 study (L&W, 1998) sampling approximately 60 landowners and 70 workers, reported that the average number of people per smallholding was 6.19 people, which would translate into a total population of about 1344 people in the Greater Steel Valley area. Although living in close proximity, black and white residents were socially separate. Steel Valley was a viable community with shops, schools, churches and bus services. Schools and churches were highly valued. Parksig, the primary school situated in Louisrus had a good reputation, and drew largely from the local population. Of the 300 children who attended the school, about 200 came from the area. The church in Louisrus was attended by 200 to 300 people per service. The area also included shops, a filling station and mobile clinic and other amenities (L&W, 1998).

In one sense, the smallholder residents could be described as "a community", since they shared the experience of being a fenceline community exposed to pollution from the steel mill. Members of the Steel Valley community had similar challenges with their health

and livelihoods as a result of the pollution. In another sense, it was not a community. It was highly segmented along racial and class lines, which coincided largely though not completely. The pollution struggle united them in some senses, while underlying racial perceptions and behaviours remained. This researcher witnessed a "community" meeting in 2004, in which white residents sat on one side, and black residents on another, as if it were the most natural thing in the world. Strategic responses to the pollution were also heavily influenced by these segmentations, for example the approach to the first two court cases, discussed below.

The white working class community combined wage work at the neighbouring ISCOR factory and in the nearby towns with subsistence agricultural production. Half the population were involved in some sort of crop or stock farming activity, though 63% of the residents were employed formally, mainly in Vanderbijlpark and Vereeniging (L&W, 1998). ISCOR was an important employer and white Steel Valley residents were part of the ISCOR commando (paramilitary force linked to the state).

On practically each of the white owned smallholdings, one would find one or more black families rendering services as farm and domestic workers. Wages were extremely low in the area with one farm labourer earning R30 a month plus 25 kg of mealie meal (in 1998). On the whole the community was poorly educated. Many had no education at all, and none of 100 informants surveyed had any tertiary level qualifications (L&W, 1998).

The strong sense of attachment to the greater Steel Valley area, expressed by many inhabitants, came out of a long history. Out of a sample of 100 people, some had lived in the area for as long as 42 years, and the majority of 73% had lived there for more than 10 years. Almost half (47% of these) had lived in the area for between 10 and 20 years and 26% for over 20 years. Many of those who had lived there for less than 10 years were children. Several tenants had been born in the area. Elizabeth Nkosi, for example, was born in the area in 1962, and has a strong sense of attachment to the greater Steel Valley area. The longest average occupation periods were in Drakeville (16 years) and Louisrus (15.7 years). Some of the plot owners had lived in the area for up to forty years. One

family of Rietkuil farmers had lived in the area for five generations. The Residential Suitability Study found that the average length of stay in the study area is around 13 years. According to the study: "Some have envisaged spending the rest of their lives there…For some it was their dream to retire on the plot with the whole family and spend the rest of their lives on the smallholding… For many, the reason they moved to the area in the first place was to find peace and contentment and to be 'away from the city life' to farm and to have space". (L&W, 1998: 26). The outcome for many residents was a shared history and a high value attached to the social networks which had been established over time. The 1998 report found that "Many participants have expressed the feeling that the community ties are very strong. 'We are one big family". People know each other well and help one another in many ways. "(L&W, 1998:25)

The low rates and taxes in the area, and the availability of land attracted a number of people - both black and white - to the area where they established smallholdings. Land was cheap. During the apartheid era it was a strictly white area, and a stronghold for white right-wing thinking. The area opened up to blacks in 1994. Many whites sold out when their animals died and crops failed.

People also kept livestock including chickens, cows, pigs and, in some cases, turkeys and ducks. Many kept animals such as dairy cows and sheep and grew fodder crops such as oats and teff. About 30% of the plot owners kept cattle, though only six herds were larger than 20 head while 24% of the plots had less than 12 head of cattle. Sheep were kept on less than 20% of the plots, with most flocks being less than 10 sheep. A small number (16%) of plots kept pigs, mostly less than 10 animals. Some poultry was found; with the largest flocks being 150 birds (L&W, 1998: 32). Most smallholders employed 2 - 3 black agricultural workers. Typical smallholdings were 2.5 morgen (2.14 ha) in size, with a resident owner, a homestead with outbuildings and a borehole fitted with an electric pump for domestic water and some irrigation.(L and W, 1998: 30) Many of the people were deeply attached to this rural lifestyle (L and W, 1998: 34).

Prospective black buyers tended to dismiss the rumours of pollution as a scare tactic on the part of white racists to keep them out of the area. For them, ownership of land was especially compelling given the history of black exclusion from land ownership in most of South Africa under apartheid (Samson Mokoena, personal communication, 2005). Besides, the greater Steel Valley area was green and watered by the Rietspruit and other rivers, so the apparent fertility of the soil was also a major attraction. Many of the people living in greater Steel Valley (including Lamontpark, Linkholm, Louisrus and Rietkuil) grew a variety of vegetables for their own consumption. This included pumpkins, tomatoes, carrots, spinach, onions, cabbage, beans and maize. Some sold vegetables in nearby towns such as Sebokeng and Vanderbijlpark, earning as much as R800 a week (L&W, 1998). It was from this social reality that Steel Valley residents pursued their discursive strategies.

Community meaning making

Discursive power is used in a wide variety of settings, from the intimate to the global. Knowledge and language are the tools with which humans construct and maintain their reality (Goffman, 1969; Berger and Luckmann, 1966). Individuals organise their life histories using human agency and imagination. With such stories, "a teller in a conversation takes a listener into a past time or 'world' and recapitulates what happened then to make a point, often a moral one" (Riessman, 1993: 3). Meaning making through narrative is a ubiquitous human activity (Riessman, 1993; Jamieson, 1984; Berger and Luckmann, 1966). This has two immediate implications. Politically, since meaning making is very widespread and continuous, it is also irrepressible, and defensive strategies that re-interpret situations, or resist dominant interpretations, are both possible and likely (Scott, 1985). Its methodological implication is that narrative structure – and with it, various conventions for making and understanding meaning - is equally ubiquitous and available for interpretation.

Narrative analysis is often used in psychology and ethnology, to link the personal experience to a political context (Riessman, 1993). The purpose of narrative analysis is "to see how respondents in interviews impose order on the flow of experience to make sense of events and actions in their lives… and how it persuades a listener of authenticity" (1993: 2). This authenticity results from previous work done by victims of traumatic events. In Riessman's examples these events are breakdown of marriages, sexual abuse, chronic illnesses and other medical experiences. The narrative work consists of telling, retelling and polishing accounts, testing them with relatives, friends and neighbours an attempt to reconstruct a self and make sense of a difficult experience. One such difficult experience is pollution experienced as a catastrophe, a process that was observed by this researcher in Steel Valley. In his book *Catastrophe Narratives*, Nasrin Qadar argues that "not only is catastrophe unexpected and shocking, it is also exceptional…. This exceptionality is linked to the incalculable dimensions of catastrophe" (Qadar, 2009:12). The challenge for the catastrophe narrative, relating to events such as the Holocaust and the Rwandan genocide in Qadar's examples, is the attempt it makes to bring something incomprehensible under words and figures, while still being driven by the energy of the event. Pollution-related experiences including illness, dislocation and disappointment in the political system, are aspects of a traumatic experience that are recognised in the environmental catastrophe literature, for example in Brown and Mikkelsen's aptly titled *No Safe Place* (1990), an account of the experiences of toxic waste pollution in Woburn in the United States.

The survivors of the pollution in Steel Valley similarly underwent a series of traumatic experiences, and responded by constructing biographical accounts which attempted to make sense of their experiences. They were generous in granting interviews to researchers and prepared to tell their stories with an elegance that seemed the outcome of countless retellings in various settings. Authenticity is a strong precondition for persuasiveness, especially in public opinion through interaction with the media. Combined with the traumatic contents of the experiences, including the complicity of officials and lack of intervention and the hollowness of constitutional and political promises, these stories serve to evoke a sense of moral outrage in the audience. This

understanding of individual meaning making is useful in analysing how the residents of Steel Valley understood the pollution, and constructed the pollution in ways that gave them discursive power. At the same time, the factual content of these narratives should be treated with some caution, as Scott points out in his classic study of "everyday resistance" by peasants in Malaysia: "The stories that circulate… are perhaps understood in this sense as propaganda… an entire argument about what is happening in this small place (1985: 22). On the other hand, residents are able to access scientific authority and buttress their arguments in that way (Gibbs, 1995).

Narratives of life and death in Steel Valley

The Cock family: "We have been ruined"

Steel Valley residents constructed their experience of the pollution, and its wide-ranging effects, in a large amount of detail. A good example is the Cock family, who bought land in the area in 1986 and lived for 14 years on a smallholding on the confluence of the unlined ISCOR canal carrying effluent to the Rietspruit river, and another effluent carrying waterway, the Rietkuilspruit. Their narrative, told in turn by different members of the family (during an interview in 2005), but with the matriarch Joey Cock as the overall framer, has the polished outline of a tale produced by a family who have discussed their experiences countless times among themselves, with friends and with outsiders.

Like many other catastrophe narratives, the Cock family starts theirs with an account of a comfortable and productive life. "We had a grain transport business, and cash store which gave us a comfortable living." The narrative highlights the innocence of the victims, and thus, without saying it outright, the cruel neglect of those who exposed them to the pollution. The Cocks relate that their children swam freely in the canal, not knowing that the canal water was polluted in the absence of any warning signboards. Grandchildren stayed on the smallholding for extended periods, including holidays and weekends. Joey Cock's grandchild Penelope Falck recalls:

> "I stayed with my grandparents for five years, from the age of 10… I swam in the canal, with no thought that the water was polluted. There were no warning sign boards… My granny's water was polluted, and we washed in it, my granny cooked food in it, we made tea and coffee from that polluted water. The taste was awful, but we had no choice than to drink it, what else do you do when you get thirsty?" (Cock Family interview, 2005).

Situated at the point where the canal and the Rietkuilspruit came together, their house was repeatedly flooded, the last time (that they were still living there) in December 1999. The Cocks called out ISCOR to help, but they only agreed to protect the house with sandbags after Neville Felix (a Steel Valley resident prominent in local government, whose narrative is taken up below in this chapter) had spoken seriously to them. Not only flooding, but ongoing damp was a problem. The walls of the house went black, and food rotted in tins. Their narrative has a strong sense of dangerous water; in the words of Joey Cock: "The ISCOR water has made all my children and grandchildren sick" (Cock family interview, 2005).

They left when the family's health, and that of their livestock, became seriously affected**.** According to Joey Cock: "The whole family got sick with kidney problems, skin growths, emphysema. My husband struggles to breathe. Until then, we were a farming family and had goats, sheep, ducks, horses, geese. They all died. Many animals were born malformed." Broken health is a core theme in the narratives constructed by the members of this family. "I used to be a fat and healthy woman," says Mrs Cock.

> "Then I started getting high blood pressure and diabetes. Some nights I go to the toilet 14 times… I cannot sleep for longer than an hour or hour and a half per night. I stay awake and am tense. I endure a lot of pain in my bladder, my back and my kidneys. If I have been sitting, I have trouble getting up and my back is sore. My legs and feet swell up. They are always painful…. I am very tense and I can never relax" (Cock family interview, 2005).

> According to her son, Wimpie: "Iron and zinc are in the water we drank. Arthritis is the thing that bothers me the most. I asked my mother to take a pistol and shoot me because I couldn't take the pain anymore". He suffers from sores "that break open and stink just like the polluted canal water." While still a young man, he is unable to find employment and survives by doing odd jobs for his father (Cock family interview, 2005).

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In these narratives, fertility and future generations have also been affected. Two of the three daughters have had hysterectomies. The grandchildren suffer from learning problems and mysterious aches and pains. Mrs Cock's daughter Lulu Geldenhuys (nee Cock) used to work for ISCOR as a crane driver (Fig 6.1). She has had two miscarriages, and both foetuses had genetic defects (Interviews February, 2004; August, 2005). She has been diagnosed with three types of cancer as well as epilepsy, and relates these to the canal water she played in as a child. "Many doctors have told me the cancer has something to do with ISCOR."

Not only their bodies, but also their livelihoods, have been destroyed. "We have been ruined," says Mrs Cock. They have no medical aid left, and little money for the ongoing medical problems they face. Their narrative projects a sense of being done in financially, and now in dire straits. Mr Cock is very disappointed about the price they got for selling their house to ISCOR – R105 000 – while the replacement value was, according to him, at least R380 000. He feels ISCOR cheated him out of the grain store on his plot, by first not including it in the valuation but later refusing to allow him to break it down and take it away:

> "All of our pension money is spent on medicine; we cannot buy food or pay for water, lights and rates. We are in terrible financial trouble. If we do not get urgent help, I don't know what will become of us. We still have to help the children and grandchildren with food and other things, and when it gets to us, there is no money left. I am so despondent, but I pray to the Dear Lord to help us." (Joey Cock, interview, February 2006)

Fig 6.1 Lulu Geldenhuys, Joey Cock's daughter who grew up swimming in the ISCOR canal, suffers from a variety of cancers and other diseases. Picture Stefan Cramer.

They have also lost the surrounding community which they enjoyed, and which supported them. Mrs Cock reports that the greater Steel Valley area, "used to be a strong community, but in the struggle against ISCOR's pollution, people became disappointed with the church. We tried to involve the NNP (New National Party), but failed. We tried the councillors of Vanderbijlpark. All the political parties were approached but only the ANC's Neville Felix came out to look**...**. (Mrs Cock interview, February 2006). A well placed observer, spiritual leader Dominee Henk Fourie has pointed out that the church community numbered nearly 1 000 people but then "the community started experiencing problems. A lot of people started dying.... I see a lot of common people, not rich, not educated, the salt of the earth, good people... We've tried to negotiate with ISCOR for years and got the cold shoulder every time" (Carte Blanche, 2003). Fourie decided to study law as a result of his experiences in Steel Valley.

In the Cock family's narrative, there can be no doubt – for the tellers and the audience, though possibly not for some scientific observers - that the pollution was real, and that ISCOR caused the pollution. The elements of their story are echoed in that of the Cook family, who had lived on their smallholding for 34 years. They report a similar loss of health, livelihood and dreams. Martha Cook had two thirds of her stomach removed as a result of stomach complaints, which she ascribes to polluted water. In 1973 the family's various sicknesses started. The children got boils, vegetables were stunted, and potatoes malformed. They gave up farming vegetables in 1987. Until then they had 2 hectares under irrigation with onions, pumpkins, cabbage, tomatoes, and beetroot. During the 1980s they sold about R800's worth of vegetables a month. Steel Valley residents Willie Cook speaks regretfully of how his plans for his retirement had collapsed with his "sheep and cows dead. They just lie down and can't stand up again" (Cook family interview, 2004).

Strike Matsepe: the promise of freedom

Black narratives, such as those of Strike Matsepe, Samson Mokoena and others, echo the same elements of destruction through pollution, but also incorporate an extra element that introduces the political expectations of freedom after the fall of apartheid: since 1990, black South Africans were for the first time allowed to own land in "white South Africa", which was a powerful driving motive. Strike Matsepe's narrative poignantly makes the point that he had a once in a lifetime chance to escape from the restrictions of apartheid and its momentum by buying a property in Steel Valley with his pension built up over a life time of hard work. He could then fulfil a dream of providing a home to his extended family. Having his dreams destroyed is tantamount to hollowing out the promise of freedom in the new, democratic South Africa.

Strike Matsepe, aged 74 in 2005, worked as a mechanic at the Coco Cola factory in Vanderbijlpark and cashed in his pension to buy a smallholding near Vanderbijlpark for R65, 000 in 1990. "This was at the time of Mandela when people could first buy land where they liked," he says. He brought his children, stepchildren, sister, brother and grandchildren to live with him in his new home and states proudly: "a big sack of mealie meal was finished in two weeks." He says: "it used to be a good place". But in the past 15 years several of his animals were born with birth defects and many have died. "In all 30 cows, 9 calves, 5 sheep, 6 goats, 3 tortoises, 7 dogs, 2 cats, 1 pig and 20 chickens have died. One pig was born here with a penis in his anus." Matsepe presently suffers from blood in his urine, tiredness and lack of concentration. Shortly before this 2005 interview, he spent 6 weeks in hospital with kidney failure. His sister Alinah had been living in good health at Clocolan, but after she joined him in Steel Valley, "…she died in July 2004 of kidney failure and cancer. She had high levels of cadmium in her blood." Strike comments with some bitterness: "My sister would be alive now without ISCOR. .....Now they supply us with piped water, but it's too late for her". Other family members are also

sick, and report that they stay inside the house because the dust and air pollution is so bad (Interview, June 2005).

Matsepe's plot is opposite the ISCOR slag heap which was fingered for extensive air pollution (see chapter 5 and Fig 5.3).

Recently having suffered a stroke, and then facing the threat of the sheriff of the court impounding all his possessions to pay legal costs from a failed court challenge, he states: "My body is full of pain". "I am trapped here," says Strike. "I can't move and buy a new place with the little money they are offering me for this plot" (Interview, Vanderbijlpark, June 2005). He is a practicing priest and *sangoma,* (traditional healer) but he has difficulty receiving clients because of the electric fences surrounding most of his property. Strike refused to move from his property at the price he was offered, and remains a stubborn presence displaying a strong determination of resistance to the bitter end. This story returns in chapter 9.

Mokoena and Ramodibe: dreams come true

Similar narratives originate from the experiences of Samson Mokoena and Rachel Ramodibe (Fig 6.2). Mokoena is the chairperson of the Steel Valley Crisis Committee formed in May 2002, and the current co-ordinator of VEJA. Like other families, his father came to live in the Steel Valley area after the first democratic elections in 1994. His father was a construction worker at ISCOR and because of having a secure job he was able to receive a bank loan to buy a small holding. Samson recalls:

> "For him this was a dream come true. Not only was he able to continue using his farming skills that he received when growing up in the Free State, he was also able to reunite our family, who were forced to live apart from each other because of apartheid laws. I fondly recall my childhood and youth in the area, where many children enjoyed the country life. We had sufficient food from our farm plots and additional income from cattle and chickens. At a young age I got actively involved in local politics, particularly the ANC

Youth League. Other black people came to live in Steel Valley which, until 1992, had been a white area. We started to develop friendships with our white neighbours. Slowly

Fig 6.2 Rachel Ramodibe, her granddaughter Rachel and Samson Mokoena in Rachel's lounge in Steel Valley shortly before her house was destroyed. Picture by Victor Munnik.

however, members of our community noticed that their crops did not thrive. Their animals started to die and many of us become sick. We traced all these problems to the pollution of the groundwater. In 2000, ISCOR agreed to compensate about 400 property owners because of environmental pollution. 150 properties were left out of this offer. In 2004 my father decided to negotiate with ISCOR and they agreed to pay him as little as R165, 000 for a 2ha plot and a spacious four bedroom house. Then we moved. Today only about 30 families are left...When you visit the area nowadays you can hardly imagine that this used to be a vibrant community with small scale farms, shops, a filling

> station, a mobile clinic and other communal infrastructure. The area is divided by electric fences, public roads have been closed and properties bulldozed" (Samson Mokoena interview 2004)

Rachel Ramodibe is one of the executive members of the Steel Valley Crisis Committee. Rachel hails from Evaton, a place with a political history similar to Alexandra in Johannesburg, one of the few urban freehold areas in the Transvaal, with an advanced political consciousness (see chapter 4). The political awareness and participation in the liberation struggle adds poignancy to the disappointment in the new political system after apartheid and especially its failure to make good on the promise of a safe and healthy environment to live in. Ten years ago she also cashed in her pension and bought a smallholding where she "wanted to live and die peacefully". She then became sick and today she has lost everything. She lost all her neighbours and was, at the time of the interview, living with her grandchild surrounded by electric fences put up by ISCOR. She does not have any source of clean water. She suffers from gallstones and other health problems since coming to live in the area. "Even at the present moment when I take a glass of borehole water the same stomach problems start" (Ramodibe interview, 2007).

ISCOR refused to negotiate with her. In 2007 and 2008, Rachel as one of the last to stay in the area, became the object of ArcelorMittal's property arm's removal actions, as related in chapter 9. She was forced off the land.

Jaap van Rensburg: Painting the bigger picture

Residents also worked up their immediate experiences, and those of their neighbours, into overviews that revealed patterns of illness in the larger community. This was the work of Jaap van Rensburg, who still lives in Louisrus, at a point further removed from the steel factory, and beyond the buy-out line that ISCOR decided on unilaterally (see chapter 8).

Van Rensburg grew up in Greater Steel Valley and has lived in the area for 36 years. He relates how, as a child, in the later fifties, he played in the wetlands where ISCOR's black

slagheap now stands, and close to the historic tar pits (discussed in chapter 4). He and his friends used to run through the stunted mealies that grew there, which would rub off black oil onto their legs. It had "a strange smell". Even then, says Van Rensburg, residents of the Greater Steel Valley were aware of the pollution problems, but as Jaap's father put it: "You don't pick a fight with your bread and butter." Since making a living from a smallholding was not easy, most people had a second job working for ISCOR (Interview, August 2005).

Van Rensburg has constructed a map, detailing the deaths of around 40 people from cancer and noting others suffering from bladder and kidney problems, gallstones, and heart problems. "The map clearly shows that the situation is not normal. There are far too many people in this small area who have died and are dying" (Interview, August 2005).

Van Rensburg also provided an enumerative overview of communal losses in the area in a letter to the MEC for Social Services and Population Development dated 26.5.2003, arguing that Steel Valley was a "viable area', but that …

> "ISCOR polluted and then bought us out. The social impact of this action was enormous. We had an excellent infrastructure in the community. We had a stable church community, a very good school, a general dealer, a dairy, an ambulance service with paramedics and a fire brigade, an Eskom office, butchery, diesel pump, bottle store, post office, municipal office and a garage." Many smallholders grew crops and "employed about three black people per plot", but most of the smallholders worked for ISCOR. ISCOR was their main source of income.
>
> "Since so many people left the community, the school had to merge with another school, the church is struggling to survive and most of the businesses had to close. The worst of all is that the value of our properties has dropped considerably. When ISCOR bought out the area, they closed some of the roads and put up electric fences. This resulted in us taking detours to get to town… A lot of the people, who were left behind, are of old age and belong in old age homes (the Louisrus area, although affected by the pollution, was not bought out.) They made all the necessary arrangements but can't move now because

> they can't get their properties sold. Financial institutions and estate agents aren't interested in the area".

Van Rensburg grew mealies, and for a time kept chickens and cattle but sold them "because of stealing". He had a garage and repair service called 'Louisrus motors' from which he made "a good living" but "the pollution closed me down". He received no compensation from ISCOR and he and his wife now live on the Old Age pension of R800 a month. Van Rensburg's health is not good. He has suffered from several heart attacks and has "blocked arteries".

He has been through many processes, meetings and forums to deal with the pollution. The most memorable seems to be the L & W report: commissioned by then water affairs minister Kader Asmal. Another was in 2003, opposing the water license application. Van Rensburg, a man of right-wing persuasions, has come to the conclusion that ISCOR (Mittal) is part of, and protected by, the international conspiracy of the Illuminati to destroy Christianity and the white man (Interview, August 2005).

Van Rensburg also made an overview, in undated handwritten notes, for his own decision making, of considerations for a buy-out. Page one details components that would be needed (e.g. distance from facilities, size of client base, affordability) to re-establish him and his family in the same circumstances. Page two details anticipated costs in addition to his resettlement costs. It is a very practical document that provides insight into the situation faced by Steel Valley residents when the buy-out became a reality. It also shows how inadequate the deals offered by ISCOR were when compared to the magnitude of the losses caused by the pollution and subsequent destruction of the community.

Bodies of evidence

Steel Valley residents experienced the pollution in their bodies, and gave evidence based on that. According to the 1998 Social Implications study (part of the L&W cost-benefit

analysis) almost a third of participants complained of ailments, ascribing them to the polluted water. The most frequently mentioned problem in the 1998 study was sinus problems or blocked noses. The second most common problem was skin irritations (rashes, boils and allergies). Problems that were mentioned less frequently but of more concern were kidney and liver problems, strokes, diarrhoea and stomach cramps, intestinal problems and cancer. Some participants attributed kidney and liver problems directly to the imbalance of metals in the water, such as the unnaturally high concentration of manganese, chrome and nickel. Some complained of exorbitant doctors' bills, running into the thousands. The 1998 study reported a suspicion that ISCOR is sitting with a great deal of confidential information with regard to the health risks and dangers associated with pollution, but that they are very careful to keep such information out of the community's awareness. There are serious questions about the health and safety standards inside Vanderbijl Steelworks, particularly the state of their records. A few years back the room containing their medical records, it is rumoured, had burnt down (Samson Mokoena, personal communication, 2006).

In the Steel Valley court case in 2001 medical evidence was presented to show:

1. Symptoms of illnesses as revealed in 500 questionnaires obtained from local people, pointed clearly to heavy metal poisoning, for example kidney diseases;
2. Tests of 26 people showed higher cadmium than the South African reference levels (the standard or average amount of cadmium in South Africans' bodies);
3. The 26 people tested showed DNA breakages 30% higher than the SA reference level, and 50% higher than the international reference level. The only common factor linking the 26 was that they all lived in Steel Valley. They must have been exposed to a cadmium pollution incident or subjected to permanent ambient exposure. It is quite possible that there was a release of cadmium, for example the steelworks flushed out a dam or stored effluent containing cadmium resulting in a big release to the environment. Although under the law then the flushing would have been "legal" because of the

> dilution, the amount of cadmium released (possibly into the groundwater, or into the canal) would not have been affected by the dilution (High Court of South Africa, 2001).

All 500 informants from the area who came forward in response to an appeal from concerned lawyers, reported health problems. Some of these were very serious, for instance involving various types of cancer. Almost everyone mentioned itchy eyes, stomach pains, kidney problems, skin rashes and headaches, "aching bones and joints", "headaches everyday", loss of energy and strength. A number also mentioned intellectual problems such as memory loss and inability to concentrate. Children born in the area showed health defects very early. One family living in Louisrus included 6 children, all of whom were suffering from stomach pains, headaches, irritated eyes and skin rashes. Many of the people had experienced periods of hospitalisation, and all had sought help from doctors and clinics in the area. Strike Matsepe's brother, Jacob Matsepe, lived with constant physical pain. Laboratory tests established abnormally high levels of lead in his system which an expert described as "unusual for a person not employed in the metal industry". Strike's sister Alinah, now deceased, had high levels of cadmium in her blood.

Many informants reported how a lack of energy and strength had led to unemployment and negatively affected their lives. A number of younger people reported that they could no longer walk any distance, or play soccer or ride a bicycle. In such a dispersed area as greater Steel Valley and with the lack of public transport, this often means a social isolation. This was expressed most vividly by a woman in her early forties who said, "I am already tired when I get out in the morning so I can't go out walking to visit friends". Visiting is a crucial source of support and activity in a community as poor as this. For many Steel Valley residents, health problems absorbed all their energy. Dealing with chronic and even fatal illness was very draining. Adults had to care for sick children and spend time and energy trying to obtain medical care.

Using discursive power – the struggle for Steel Valley

Steel Valley residents used whatever power they could muster to fight against the pollution. This included enlisting expertise and entering arenas, where they insisted on claiming their rights. They entered the new democratic local government, hired legal expertise, participated in forums, took the polluter to court a number of times, disputed license applications and interacted extensively with the media. Neville Felix, a highly politicised person with a background in the South African struggle against apartheid, illustrates this in his own story, which includes the vision for a new community, rescued from Steel Valley, and reconstituted elsewhere.

Believing in the new South Africa: Neville Felix's story

From the other side of the political spectrum to Jaap van Rensburg, comes the narrative of Neville Felix – an ANC underground operative, member of the South African Communist Party and ardent supporter of the new government. His story reveals the sharp cleavages within the community and the dramatic achievement of political unity in the local elections in order to resist the pollution, set against the bitter appointment Steel Valley experienced by residents who expected government to fulfil its promise of Environmental Justice in the constitution. It also illustrates an important aspect of environmental mobilization: the coming into awareness of previously unknown, disregarded or denied pollution.

Neville Felix is a colourful character, proud of his mixed ancestry including slaves, 1820 settlers, Chinese and French forebears. Conservative residents of Steel Valley thought "an Arab" had moved into their community when he moved into the area. An ANC activist and underground operative he anticipated the new South Africa by buying, in 1989, a smallholding through an elaborate company arrangement, because only whites were legally allowed to purchase property there Felix's biography, as he recounts it, ties the pollution struggle in Steel Valley into the politics of the liberation struggle. Felix had

been born in District Six, in Cape Town, and had lived through one of the bitterest apartheid removals of people, then in inner Cape Town, where he came in contact with political activism influenced both by the church and banned pamphlets on Marx and Lenin. His first taste of activism came with a campaign and court case against the construction company Murray and Roberts for defective houses (Felix interviews, April 2005).

Felix in Steel Valley had never had so much space before. He had space to park all the heavy equipment he used as a building contractor. His new house had eight bedrooms. The family soon ran a few chickens and sheep on the 5½ acres they now owned. A special source of pride was the 300 fruit trees: peaches, apricots, plums, pears. And then there was the free underground water - enough to use for precast construction, one of Felix's specialities in the building trade. The smallholding was conveniently close to Felix's place of work: as project and logistics manager for Medicins Sans Frontiers (MSF) he was installing water pumps and distributing medicines in informal settlements in the area, like Wheelers' Farm and Vlakfontein. He was a member of the ANC's Lenasia branch, and was organizing ANC structures in the area, which was still illegal at that stage (Felix interviews, April 2005).

Felix and his wife threw themselves into local activism to stop the injustices they saw on the smallholdings around them. His dramatic version of events reveals the deep cleavages wrought by apartheid, as he tells of how black farm workers, paid a pittance by their white employers, were being beaten savagely and on occasion dragged over dirt roads behind farm *bakkies* (pick-up trucks) as punishment. (Although such brutal treatment of farmworkers has been reported in the media, its occurrence in Steel Valley was not independently established. It may have been added to the description for dramatic effect – see Scott, 1985). The Felixes started organizing the farm workers, and soon had regular crowds of them on their farm. When a fire, common in winter months on the dry Highveld grasslands, threatened the Felixes' smallholding, large numbers of black people would appear to put it out. While their right-wing neighbours resented them – and for example killed their dogs by slicing off their heads – they also feared them. "The rumour

was that hordes of black friends would descend on any white farmer that would dare touch the Felixes", said Felix (interviews, April 2005).

It was somewhere in 1991 that the Felix family noticed something odd in their water. The taste changed, it smelled odd and it looked a bit oily. The fruit trees were not growing or producing fruit. The only neighbours he could speak to were the Smits. They had also noticed problems with the water. But the pollution issue was completely swept aside by the dramatic developments of the political transition after 1990, building up to the country's first democratic election in 1994. Felix and his wife were involved in ANC structures in the province, served on the RDP structures and were preparing for ANC government after 1994. His neighbours were panicking as the elections in 1994 approached. Felix recounts how these whites were ready to defend themselves behind sandbags and with search lights. A radical change was about: the dawn of the new South Africa (interviews, April 2005).

Then, around 1994, Felix discovered that four families in the Steel Valley area were receiving piped water from ISCOR. Why was this? There also seemed to be an unnaturally high number of sick people. In 1995, residents saw a white residue on the side of the road next to ISCOR. But again, these concerns were swept aside by the more urgent political tasks of building up democratic government at national, provincial and local level. Felix was part of the national Reconstruction and Development Programme (RDP) core group for the Vaal Triangle. Community Development Forums were set up, but the pollution issue was not on their agenda. Felix and his wife also became part of local government structures. Felix represented the Vaal River area in the West Rand district council. Finally, in 1996, the Western Gauteng Services Council and its subsection of the Vaal River approached ISCOR about the pollution problem. This was not an easy thing to do, says Felix, as ISCOR was powerful. Its activities represented 65% of the GDP of the area. In December 1995, a meeting took place where people were told about the pollution suspicions (Felix interview, 2005).

Engaging the issue and enlisting expertise

Steel Valley residents were well aware of the limited authority of their own discursive power, and made formal attempts to strengthen anecdotal observation with "scientific authority". Felix relates how the residents purposely called on outside knowledge. In February 1996, the district council's legal department set up a discussion with ISCOR which developed into the ISCOR Pollution Forum. The district council met with WISA (the Water Institute of South Africa, an organisation of the country's water professionals) and the Water Research Commission, to get access to their expertise. Felix reports that the council went out of its way to draw in outside expertise, and resolve the issue:

> "We pulled ISCOR and other industries into it, as well as DWAF. Gauteng's Department of Agriculture, Conservation, Environment and Land was brought on board. We requested assistance from the parliamentary portfolio committee. We met with advocate Duard Barnard, through the Vaal River Catchment Association, and contracted him through the Western Services Council. The Council's scientists did tests of the soil and the water, and found it to be contaminated with salts and heavy metals," says Felix.
>
> "Then, ISCOR was speaking to us. They said they were sorry to hear there was a problem, and they would like to be part of the solution. At this stage the Forum had weekly meetings. We had to argue our case technically" (Felix interviews, April 2005).

Arguing the case technically meant that the people of Steel Valley not only had to know to what extent they had been polluted, but also prove to authorities and eventually the courts, that the pollution had taken place. It was not as straightforward as they might have expected.

The vision: Mooi Water (Beautiful Water)

Felix, with the support of the district council, presented a strategy to the Pollution Forum to have Steel Valley declared a disaster area, and to facilitate a process that would result

in the relocation of the whole Steel Valley on a nearby piece of land; the settlement, under the land reform programme, of farm workers that would lose their land in the move; the establishment of a health trust with a research arm specializing in the health effects of industrial pollution, as well as the clean-up of Steel Valley once the people are gone. This, it had been calculated, would have cost about R100 million, compared to the R66 million per day running costs of ISCOR Vanderbijlpark (interviews, April 2005).

Part of the Mooi Waters vision was to have a rehabilitated Steel Valley, Rietkuil and other areas around ISCOR as showcases of sustainable development, in time for the World Summit on Sustainable Development (WSSD). Mooi Water, a piece of land belonging to the West Rand District Council, fronting on the Vaal River (Barrage and Vaal Oewer Areas), was identified for the resurrection of the Steel Valley community. It was 20 km away and reasonably out of the pollution zone. The farm could be purchased at a low price and the Council could use its own staff (at no extra cost) to demarcate the land into smallholdings, similar to those in Steel Valley. Those who had property would have houses built for them. The house building exercise would in itself create jobs and stimulate business locally over a 3 to 6 or even 12 month period. The houses and outbuildings would be the same size and, because they would be new, even better than before. All 563 smallholdings from Steel Valley could be accommodated, and there would still be a third of the land left over. This would be sold to new people joining the community, and the money put into a community trust. A community hall, a police station and schools would be built. The river front would be kept as a public park. The overall cost would be around R56 million for around 700 new houses, which would take 6 months to a year to complete. The land would cost R2,5 million, the water treatment plant and reticulation system would cost between R18 and R20 million (interviews, April 2005).

Where would the farm workers or people living on the plots, growing their own vegetables and keeping some livestock go if the property owners left them behind? There was a well-developed plan for them too. Says Felix: “We negotiated with Derek Hanekom, minister of land affairs, and reached an agreement with farmer Dirkie Ferreira,

whose farm was next to Ramolele School for government to buy the land and establish and eco-agrivillage. The farm was a going concern, with a dairy making around 40 000 per month, on milk alone" (Felix interviews, April 2005).

Having everybody removed would give ISCOR the opportunity to arrest the pollution plume and rehabilitate the polluted earth. The idea was to use the high water table to establish a marshland to sequester the dangerous chemicals in reeds, for example. Felix and other councillors had made contacts in Europe who could supply this type of technology. "It would have been a win-win situation for everybody," says Felix. "ISCOR would have scored a world first in cleaning up its pollution. It would have been a proud attraction at the WSSD in 2002, instead of a place where people protested. We could have shown the world how to do it…" The plan also included setting up a medical trust, managed by ISCOR and the department of Health. It would have a register of beneficiaries, the residents of Steel Valley (interviews, April 2005).

"ISCOR's refusal to entertain this proposal made the Forum break down," says Felix. "We said to them: 'we are the new South Africa, and we have the backing of the new government'… We never wanted to close ISCOR down, or undermine them as an institution, or undermine the jobs of the people there. Two days' production costs (of R66 million per day) would be more than we needed for this plan. We would have had a brilliant story to tell at the WSSD in 2002, because we were pioneering a new trajectory which would result in a win-win situation that all South Africans could be proud of." In the event, history took a different route.

Engaging the Media

Throughout this struggle, Steel Valley residents engaged with the media. Almost without exception journalists found the Steel Valley stories convincing and compelling. The exception was the constant stream of stories on business pages where the issue was judged in terms of profits and share price. The basis for this persuasiveness was the

authenticity that came through the narratives of suffering that were elaborated and presented by Steel Valley residents. One example is a round of media attention in Feb 2001 which resulted from the serving of court papers served. A story headlined *Vaal community being poisoned to death* (Magardie, K., (2001, February, 9) paints a picture of community made sick by the pollution, living in an area fenced in by electric fences with "an eerie resemblance to a concentration camp". The story in the intellectual weekly reports on health problems and tells the stories of a number of residents including Johannes Dewing and Willie Cooks. Some information coming from the archives, particularly the Wiid report, was included.

Towards the end of the year in the Afrikaans daily *Beeld*, in an article written by Elize Tempelhoff, focuses on the court case again (2001, November 30). A new element is evidence provided by the whistle blower, Pieter van Eeden. Van Eeden's position is quoted:

> "Van Eeden says he was appointed around 17 months ago as senior scientist at ISCOR tasked with managing environmental pollution, specifically water quality. He tested the toxicity of the plant's effluent himself, and had it tested as well, including the water in the boreholes of the smallholdings in a radius of 1 km from the plant. It was found that the groundwater and surface water entering the Rietkuil from the plant, arriving in the Rietspruit and ending up in the Vaal River at the Barrage, is polluted by an excess of inorganic substances that attack living cells. Van Eeden says that people that are exposed to this water over the long term can possibly develop cancer."

This report combines the directness of journalism with the certainty of quoting a "senior scientist" who worked on the inside. Dr Pieter van Eeden was employed by ISCOR when he blew the whistle on their environmental practices, thereby providing valuable material, from the perspective of Steel Valley residents, for their court case in 2001. Van Eeden's actions added scientific authority to the Steel Valley case, and his narrative reflects that.

Conclusions: encountering the dispositive

This chapter contains pointed examples of the creation of discursive resources, and their deployment in arenas of public opinion and immediate mobilization in fenceline communities, as well as in the local government political system. Citizens developed their own discursive resources, and reached out to knowledge holders they could identify. Residents were able to work together across racial, political and class lines (although these divisions remained) in order to use local government as a vehicle. They developed a coherent view of the pollution, and who was responsible for the pollution. They developed a version of their experience which they tested with each other. Their stories made an impact on the media – which reproduced them in great detail – and hence on public opinion.

ISCOR had never been challenged before, and the discursive resources that Steel Valley managed to create and access were exceptional. Nevertheless, the Steel Valley community was largely defeated. However, their challenge forced both the polluter and the regulator into a series of legitimation exercises that resulted in the creation of a more fully developed pollution dispositive, stronger regulation, strengthened the Environmental Justice movement and created an ongoing and very public battleground about pollution. Steel Valley residents encountered a "resistance" to their drive to stop and overturn the pollution machine they faced. They encountered a complex of interests, agendas, historical momentum, power imbalances, unspoken alliances and unseen calculations that all added up to a single result: the promise of a right to a healthy environment was not fulfilled. It was as if a bigger logic, not visible and not reasonable, was at work, frustrating their efforts. This was an experience of the pollution dispositive.

Many of the actions that the community wanted depended on the new government – a new government which had promised to be people-centred, human rights based and had an expressed right to Environmental Justice in the constitution. Their plans to make a reality of the Mooi Waters Vision, or to have the area declared a disaster zone, or to name ISCOR as a polluter with consequent liabilities, required action from the state. The next

two chapters detail how the community interacted with the national government and the polluter.

Chapter 7: Looking to the state for justice

> "Everyone has the right (a) to an environment that is not harmful to their health or well-being, and (b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that – prevent pollution and ecological degradation…"
>
> Environmental right in the South African constitution of 1996, section 24.

Introduction: the right to a healthy environment

Steel Valley residents saw the arrival of the new South Africa as an opportunity to defend themselves against what they saw as ISCOR's obvious imposition of pollution on their bodies, assets and community. They used the discursive resources they could create and access in their own immediate community and the immediate political structure available to them, the local government. They were responding to the new political conditions, created by the new government and couched in terms of discourses of human rights, freedom and people-centred approaches that accompanied the liberation struggle and were now dominant. How and whether the new state would live up to these promises would determine the shape of the pollution dispositive.

As regulator but also as political arbiter about the Environmental Justice right, it can be argued that the state was called upon by both polluter and polluted to play a role in their discursive strategies, as will be shown below in this chapter. The polluted, through local government structures, wanted the state to declare the pollution real; assign blame and make the polluter pay compensation as well as undertake remediation. The polluter's strategy appeared to be to enrol the state in helping it to escape liability, by not declaring the pollution as real, not assigning it the blame for the pollution, not forcing it to pay compensation and undertake remediation, and allowing it to get rid of the problem by getting rid of the community and enclosing Steel Valley. These opposing calls on the

state indicate that the state held, and was seen to hold, substantive discursive power: to define the pollution, assign blame and prescribe the consequences.

The challenge for the analyst is to distinguish how many degrees of freedom the state had in this situation. The question is answered by looking at the state's choices in this chapter, and the broader dynamics behind these choices in chapter 10.

The state is indeed a powerful actor in organising and controlling the discourses in terms of which decisions are made about the consequences of pollution. The state guarantees and supports a legal system. It dispenses administrative justice. It regulates pollution and manages other risks to the public. The state constitutes and controls many arenas in society, and therefore has a crucial influence on decision making processes. The state holds very strong discursive authority, also known as public power (Bogason, 2000). The state's legitimacy derives from its claim to be acting in the national interest – in the interest of all – although its actions may in fact reflect far narrower interests. This responds to Thompson's definition of "legitimation" in ideological terms (chapter 2). Because legitimacy is fundamental to state power, the state vigilantly looks after its public image through public relations management. In terms developed by Habermas, it could be said to searching for public acclaim. This acclaim is brought about through democratic elections through a party machinery, public opinion, policy statements etc. (Habermas, 1996). However, it is also closely related to the material provision by the state as well as its role as a protector (Beck, 1992; Weale, 1992; Offe, 1984).

While the state creates and maintains legitimacy for itself, it can also lend legitimacy to others through its pronouncements. In Steel Valley, when the state defended its own actions, by claiming that the pollution problems had been solved, it also absolved the polluter. Its failure to declare that the pollution was real denied its citizens a basis from which to act, for example to demand compensation. The role of the state in a risk society – in this case a double risk society – as guarantor of people's safety (including from pollution) and at the same time poverty alleviation through growth is complicated and contradictory. The state holds large discretion over which information it protects or

releases, although it may be challenged legally for its decisions by both corporates and activist groups.

After an introduction to the history of the regulator, this chapter examines three crucial sets of events that show how the state responded to these expectations. First, the focus is on a process starting in 1994, in which the regulator showed a strong interest in disciplining ISCOR for its pollution. This chapter follows and then analyses this impulse and how it was transformed into a drive for ecological modernisation via regulation (licensing). It touches on the process around the still secret Master Plan (at time of writing in October 2012, VEJA was still trying to obtain a copy of the Master Plan from ArcelorMittal), showing how ISCOR enrolled the regulator and its opponents in an elaborate performance of "environmental management". The main discussion on the Master Plan, however, is in the next chapter on the role of ISCOR.

The chapter then follows the power of the state to create an arena for discussion, information gathering and decision making, in the shape of the DWAF forum. It traces the fortunes of the forum, its outcomes and aftermath which most notably included the buy-out. The focus here is on the Main Report of the Cost Benefit Analysis (L&W Environmental, 1998) showing how the decision about the future of Steel Valley was framed through the deployment of expertise, and how DWA colluded in keeping pollution information from citizens. Finally, it examines the response of the state to accusations of failure to deal with the Steel Valley pollution problem, and shows how the state, in trying to protect its own legitimacy, lent legitimacy to the polluter.

In doing this, the chapter relies closely on a number of texts and interviews. The stricter regulator attention paid to ISCOR in the period 1994 - 1996 is based on correspondence, mostly between the regulator and ISCOR, with some internal notes and background memos as well. These materials came into the public domain in a public forum (the Iscor Pollution Forum, 1997) and then in a court case (the Johnny Horne court case, in 1998), a whistle blower revealing information from inside the steel factory's environmental management unit (Van Eeden, interview 2005), and evidence of health and livelihood

impacts, as well as further documents gathered for two court cases, the High Court of South Africa, Case no 00420/01, which carried on into 2003, and another case prepared as an appeal against the dismissal of the Case no 00420/01 (personal communication Margie Victor, October 2012). The whistle blower, Dr Pieter van Eeden, specified that he placed pollution evidence in the public domain in conformance with the provision of the National Environmental Management Act, which provides for whistle blowing (Van Eeden, personal communication, 2011).

These materials are therefore public, but not originally written to be public, thus providing a rare insight into decision making process within the regulator, an example of how discourses shifting across contexts (see Blommaert, 2001). The process, by which the regulator managed ISCOR into ecological modernisation through stricter regulation, is explored via readings of water use permits, strategic background documentation for these decisions, associated correspondence and minutes. The main attention here is on the Cost Benefit Analysis as a decision making discursive encounter. The analysis of the regulator's response to the media is based on media reports and internal DWA documents for strategic positioning. It was difficult to get formal interviews with current and previous state officials, and this chapter therefore relies mostly on documentation and occasional interactions with state officials.

Water quality regulation in South Africa before 1990

The pollution outlined in chapters 4 and 5 took place during a period in which, officially, a regulation system was in place. What follows is a first sketch of a water quality regulation history in South Africa. A detailed study would no doubt reveal more information and interesting perspectives, and other scholars are encouraged to undertake it.

Large-scale water provision in the Vaal Triangle, to mining, industrial and urban areas, dates back to the founding of the Rand Water Board in 1903. Rand Water grew to a huge organisation that today provides water to more than 10 million people and many

industries in the Gauteng province, with outliers in other provinces (Cooks, 2004; Tempelhoff, 2003).

From 1912 the focus of the South African state's water managers was on water in agriculture, as reflected in the title of the law which ruled water affairs: the Irrigation and Conservation of Waters Act (of 1912). The Department of Water Affairs' main activity remained building dams and providing bulk water until 1994, when the provision of water to black communities became an important concern.

Until 1956, water pollution was seen as a health hazard and dealt with under local nuisance or health regulations. The Water Act of 1956 dealt, for the first time, with municipal and industrial water in a rapidly industrialising society since World War II, of which the Vaal Triangle was an important part. In 1956 the first requirements were brought in to return water – of the same volume as abstracted - to the same stream after adequate purification. Regulations under the Act were extended from time to time by regulations developed by the CSIR and SA Bureau of Standards (SABS), until replaced by the new, post-apartheid Water Act in 1998.

The regulation approach was based on a philosophy of "fitness for use" for downstream water users in categories of urban, industrial, agricultural, recreation and conservation use. In practice, pollution control was based on controlling point sources – the ends of the pipes releasing waste water into streams. The system was implemented by reference to effluent standards, the uniform, special and phosphate standards. An important part of this system for large industries like ISCOR and SASOL was a pattern of official "exemptions", which means lowering the standards for specific polluters below the general standard (see the discussion of Exemption 1998b below for an example). This approach is a double-edged sword. On the one hand, it makes for ongoing and close contact between the regulator and the regulated, which can lead to local and intimate knowledge of the particular industry's systems and processes in use. It ties into the concept of BATNEEC (best available technology not entailing excessive cost), with the promise that as technology improves, the pollution control can improve. This however

places great power with the polluter, as technology improves not only in the abstract world of design, but has to be an investment decision by the firm, which takes place in terms of available capital, shareholders' strategies and preferences, expected profit which depends on market conditions. Improvements therefore happen – if they happen at all – only in lumpy sums, that is, step by step as big pieces of equipment have to be replaced or retrofitted. This was the approach that underlay the first meetings between DWAF and ISCOR in the 1960s explicitly to implement the 1956 Act, discussed above.

It does not seem that there was a lack of knowledge on the subject of water pollution, as well as air pollution, on the side of industry. The 1970s, in particular, was a time of growth in knowledge of pollution in US and UK. Historian Johann Tempelhoff argues (personal communication, 2006) that Rand Water, and presumably other water professionals, were in touch with these developments. In the 1970s, there was a definite knowledge and concern about water and air pollution in academic and professional circles. In the 1970s according to Van Wyk (2001, quoting Laburn, 1979: 1978; 1973) the problems of salinization and heavy metals pollution from mining and industry were well known to Rand Water and other water professionals. This can be argued to have extended to DWAF, as its director-general Funke published in technical journals, while he was involved with ISCOR regulation (Van Duuren et al, 1980). The conference *Focus on the Vaal* (1980), for example, was a frank and open discussion of the situation. It could be that the increasingly difficult circumstances in South Africa of the late 1970s and beyond, in particular increasing international political pressure and isolation, led to an effective downgrading of this extensive knowledge.

In the literature on South African environmental regulation, the lack of capacity to implement legislated regulations is a constant theme, both for air and water (Lusher and Ramsden, 1992; 1983; Rabie, 1976). Over three decades the problem seems to remain:

> "From the inception of the Water Act in 1956 to 1988, no formal technical training courses were given to those entrusted with implementation of the sections of the Water

> Act devoted to pollution control. Experience was gained on the 'do as I do, say as I say' principle…"

What was missing in quality was also missing in quantity, as Lusher and Ramsden lament:

> "One difficult problem is that the enforcement of these effluent standards is dependent… on an adequate number of inspectors who should constantly monitor the effluent from industries. There are simply not sufficient inspectors available to perform this task thoroughly…" (Lusher and Ramsden, 1992: 486)

Since water quality control was focused on end-of-pipe effluent, it largely ignored the impacts of effluent discharges on water quality in receiving waters. This became the next frontier for water regulation. Since 1991, there was a shift, at least in theory, from "uniform effluent standards" to a "receiving water quality objectives" approach, because the quality of water resources in SA continued to deteriorate. Theoretically this is a very different approach. Attention shifts from the previous focus of what comes out of the waste water pipe, to what happens to the water in the receiving stream. It moves from the question (above) of how clean the returning water can be from the point of view of the polluter, to what the river or other water body can deal with. However, water bodies in this context remained primarily interesting because of their "absorptive capacity". Under this concept, the capacity to assimilate wastes is limited, and water managers must take that into account. This assimilative capacity also had to be shared between all those who wanted to dispose of their waste in their water – without exceeding the overall capacity of the water bodies to receive the waste.

The receiving water quality approach had – or should have had - implications for testing methods as well. It follows from this approach that the total pollutant load that the regulator and the polluter should be paying attention to, is likely to be bigger than the chemicals that are tested for individually. This is because there are interactions between the chemicals and other effects. For example, the acidity in the water (level of pH) can mobilise heavy metals from sediments and add them to the pollutant load. In theory,

moving the focus to the receiving water body opens the potential to deal with the total effect. Equally, testing methods should therefore logically move to a type of overall toxicity test – e.g. the effect on indicator species (specific species of fish and insects) or cell culture (Whitcutt *et al*, 2004).

This is exactly what Van Eeden, who later became a whistle blower on ISCOR's pollution practices, was lobbying for in ISCOR by 2000 (see chapter 8 for discussion). Van Eeden argues that this testing would see whether the water is actually safe or not, whereas what ISCOR wanted to continue (and did continue) to do – in his view - was merely to make sure they comply with regulations about what was coming out the end of their pipes, whether it was safe for people and eco-systems or not (Van Eeden, 2005).

Since 1991, DWAF embarked on a process of developing the skills, technologies, specific policies and strategies required to implement this new approach (Lusher and Ramsden, 1992: 462). But there were many "obstacles to be cleared before (a) National Water Quality Management System can be fully implemented". On the capacity side, they include a culture of making work for civil servants. Their comment is exasperated and describes the system as an ineffectual paper-pusher's paradise:

> "The Water Act, in general, is an administration generator. It was drawn up at a time when one-third of all white South Africans would, at some stage in their lives, be employed by the Public Service. It bristles with requirements for permits which are merely accountancy devices, or certificates of registration of some sort, being largely unenforceable because of the cost required to run the necessary inspectorate. They are therefore tokens with little relevance to planning needs or permissions and serve no particular control purpose" (Lusher and Ramsden, 1992: 468).

It is interesting to note that these comments came "from the inside" of water institutions. In 1992, Lusher was Deputy Director General: Water Quality of DWAF (Western Cape Region) and Ramsden was the general manager, corporate services, Rand Water Board. Overall, then, while there was at least adequate knowledge about water pollution, there were constant constraints in terms of capacity to implement these ideas. For water

pollution, there were not "an adequate number of inspectors" (Lusher and Ramsden, 1992: 486). There were also difficulties of evidence: "a high degree of technical proof is required for a successful prosecution" (1992: 487). The concept of rendering water less fit requires knowledge of water quality before the offence, and "the acute shortage of public prosecutors …with experience in handling technical matters" was seen as an obstacle. The situation was similar in air pollution (Rabie, 1976) and much worse in waste management (Hallowes and Munnik, 2008).

Probably the most important determining factor in actual implementation of pollution regulation, were the unequal power relationships between polluter and regulator. Regulators had to rely on information about processes and effluents provided by industry. Legal sanctions like fines were so low that they were worth paying many times over before it made economic sense to invest in pollution control equipment. Where stronger sanctions were available, officials were reluctant to use these. It seemed to have been unthinkable to revoke a permit to use water, dispose of effluent or continue to operate a scheduled (i.e. air polluting) process. As a result, "cosy relationships" developed between the regulator and the regulated industries (Van Eeden, interview 2005). The opinion has been expressed (at an Upper Vaal catchment forum meeting in 2009) that water quality control officers regard their office as a stepping stone to employment in industry, with far better wages.

There is no question that water quality legislation did improve in these years, and powers were put into the hands of the Minister of Water Affairs which could have been used to deal with the ISCOR case. DWAF, for example, had the power to inspect: "The DG may authorise inspection of any land on which substances that could cause pollution are present" (Lusher and Ramsden, 1992: 473). DWAF also had the power to clean up pollution, and force polluters to pay for the clean-up. The water amendment act 68 of 1987, "…introduced certain improvements aimed at regulating water pollution, and increased the penalties for pollution" (Lusher and Ramsden, 1992: 491). These were strengthened in Section 22 A of the 1993 amendment, which empowered the Minister of

Water Affairs to recover the cost from cleaning up pollution from those who caused the pollution or gained from it.

However, the practical basis for awarding and monitoring water use was still the system of uniform effluent standards, as will be demonstrated below in this and the next chapter.

The president's council, absorptive capacity and integrated environmental management

At the end of the apartheid era, growing international attention to environmental issues found an echo in South Africa as well. It coincided with a time of increasing attention to environmental issues exemplified in the 1992 Earth Summit (the UNCED), which produced Agenda 21 (UN, 1993). There was increased public awareness and concern in public opinion internationally – as well as in South Africa. At the time, a number of books drew attention to the issues in South Africa in the same year, among them Cock and Koch's *Going Green: People, politics and the environment in South Africa* (1991), the collection of essays edited by Mamphela Ramphele in *Restoring the Land: Environment and Change in Post-apartheid South Africa* (1991), " James Clarke's *Back to Earth: South Africa's environmental challenges* (1991), Brian Huntley, Roy Siegfried and Clem Sunter's business-oriented *South African Environments into the 21st Century* (1989) as well as the "Poverty and The Environment" Conference organised by the Environmental Planning Professions' Interdisciplinary Committee (1992). They all sketched pictures of the environmental impact, neglect, degradation that happened during apartheid. *Going Green* argued that "the environmental challenges "facing South Africa are deeply political… the crisis is embedded in people's lack of access to power and resources, and cannot be resolved until these underlying causes are addressed". It also saw the environment not as "confined to preserving wilderness areas of endangered species"… "The environment is where people live and work, so the major concern of a new environmental policy must be to ensure that all South Africans can live in health and safety" (back cover, 1991). Similarly *Restoring the land* stated in the foreword: "As (South Africa) debates its political and economic future, the environment is emerging as a

central issue. Apartheid policies not only discriminated racially – they directly contributed to some of the worst examples of environmental degradation and pollution in the world" (1991: vii).

A state research institution, the Council for Scientific and Industrial Research (CSIR), in a desktop study (CSIR 1991) sketched the general situation of waste management and pollution control. It was clearly aware of pressure from environmentalists as it warned "action groups in whatever form are here to stay" and advised arguably unmoved authorities that they would need to develop public relations expertise and "promote an image of being more aggressive and proactive in the field of environmental protection" (CSIR, 1991: 297). The late apartheid government had in fact been preparing a response. The 1991 *Report of the Three Committees of the President's Council on a National Environmental Management System* reported that it had, since 1989, been developing a general response to the situation: a system of integrated environmental management IEM). What is IEM? A course on environmental management at the time (Nel, 1992: 9) described it as:

> "An integrated approach to environmental management (which) will strive towards synthesizing all the natural and cultural environmental variables which can be impacted upon… combining them with relevant elements from the industrial and technological arenas such as: sound management principles which are translated and cascaded down from a mission statement to operational objectives, an appropriate communication network, staff training programmes and the employment of environmental management tools, through the life cycle of any project."

The Presidents Council (1991:6) conceived of the growth economy and environmental protection as competing agendas:

> "1.4.8. As a developing country, with vast backlogs to be made up in areas such as housing, the provision of social services and the creation of jobs, South Africa has not the luxury, enjoyed by many developed countries, of being able to halt or limit development for pure environmental reasons. Indeed, any attempt to halt of limit development may

> well be regarded as an attempt by the privileged community to lock others, hitherto denied such benefits, out of the advantage of economic development. The improvement of the quality of life of all South Africans – an objective subscribed to by the present Government – depends on both development and environmental conservation. The proposed management system must be capable of reconciling the two, by following the procedure known as Integrated Environmental Management (IEM).

This conceptualisation led to the council's very utilitarian definition of pollution: (Presidents Council, 1991: 138)

> "4.4.1. An important service provided by the environment is the capacity to assimilate waste products which result from economic activity. When this assimilative capacity is exceeded, the result is "pollution".

A stricter regulator in the new South Africa

The transition from surplus power to the politics of hegemony (Greenstein, 2003; Marais, 2001) included a broad process focused on environmental issues, known as the Consultative National Environmental Policy Process, or CONNEPP (DEAT, 1996) which resulted in the inscription of an environmental right in the constitution. It was the fruition of a process started by environmental groups like Earthlife Africa in the late 1980s, the publication of a series of environmental books (Clarke, 1991; Koch and Cock, 1991; Ramphele, 1991), a growth in environmental journalism as well as a pre-existing conservation and environment lobby. The transition also created a state that was explicitly based on human rights and could be expected to protect its citizens.

Discussions at national level included, apart from environmental rights, the construction of a new approach to water resources and services: the 1990 SCOWSAS process, culminating in the 1994 White Paper on Water, the 1996 Constitution and the Water Services Act, also in 1996, the Water Act of 1998, as well as the new National Environmental Management Act (NEMA). The underlying philosophy changed in that

water resources now belonged to the citizens of the country, while the state held it in custodianship for them. Previously, water had belonged to the riparian owners.

Soon after the first democratic elections in 1994, DWAF became much more active in its regulation of pollution from ISCOR. Possibly officials were emboldened by the belief that a new era in pollution control had arrived.

The regulator is composed not only of rules, laws and procedures, but also of specific individuals who interpret and use these regulatory instruments. One such individual was dr Carin Bosman, who joined the Department of Water Affairs and Forestry in 1993 as senior water pollution control officer for the Highveld region, and became responsible for regulating the ISCOR Works (Bosman, 1995, Nov 14). Bosman, as a DWAF official, had access to "decades' worth of correspondence" between DWAF and ISCOR on the pollution, the training to understand what it meant and the interest to read through it. This information, built up in an era of non-defensive communication in the "safe" space of the relationship between the parastatal and the state department, was explicit about the pollution (see chapter 5).

Internal DWAF memos from Bosman's time on this case (1993 – 1996, which became public during the 1997 Pollution Forum) show that ISCOR was informed in 1994 that its pollution was "unacceptable". In September 1994 a major spill occurred which by ISCOR's admission, involved a tank full of chromium salts which had been pumped directly into the storm water drain. The incident was not reported though an operator at the water treatment plant noticed yellow coloured water entering the plant. Chromium is a human carcinogen which, in its hexavalent form, is toxic by both inhalation and ingestion. Bosman laid a charge on the 14th of August 1995, charging that ISCOR was contravening its license conditions by exceeding the allowable levels for manganese in its effluent carried to the Rietspruit. The Pollution Investigation and Prosecution Report, 14/8/95, is an interesting document. It shows the state operating in a legal arena, through a sworn affidavit which contains the details of sampling which result in forensic evidence, in the presence of a police officer. Photographs were taken, and a map drawn,

of the various sampling points. The report also specified the standards with which the effluent should comply. It pointed out that the effluent seldom complied with one of these standards, namely manganese. Despite repeated efforts by the department, the effluent still did not comply. The sample taken on 14/8/95 showed a manganese concentration of 0.51 mg/l, which exceeded the legal standard of 0.4 mg/l. The report recommended (1) that a prosecution be initiated, "but only on condition that such an action would be successful", and (2) that "whether prosecution is initiated or not, the requirements of article 21 (1) (b) should be applied in order to ensure that further pollution from ISCOR Works Vanderbijlpark can be avoided".

The two recommendations encapsulate the debate and decision that would follow in the department. But first, it is worth noting that the official recommendation went no further than recommending that the existing law should be applied. It is a revealing commentary in a situation where ISCOR had not been in compliance up to that point, and had not been pushed by the regulator to do so. A number of other experiences reinforce this point. In September 1995, DWAF complained that ISCOR's monitoring was not being done properly. DWAF documentation shows that these breaches had been the rule rather than the exception for some time. The first charge was withdrawn, but DWAF continued to react sharply to pollution incidents. Another incident occurred shortly before Christmas 1995. Carin Bosman recalls:

> "I knew someone in their (ISCOR's) environmental unit. He would call me to inform me when they were misbehaving. So he called me to tell me that he was suspicious: a day before Christmas all their environmental managers were to go on compulsory leave. So I went with a colleague to take prosecution samples. We first took pollution samples outside the fence. When we wanted to come in the security guard said we could not. We told him that this is the new South Africa and that we would charge him with obstruction of justice. We got him to phone his bosses, who said 'let them go in, but write down everything they do'. The samples did show an illegal discharge, and I wrote a prosecution notice" (Bosman, personal communication, Oct 2009).

This incident also suggests that a conflict existed between environmental staff and management, suggesting that while environmental staff may want to stick to environmental and legal standards, the management will override or even intentionally break the rules behind their backs. Equally interesting is that an environmental official then phoned DWAF and precipitated an inspection. It is often said informally that environmental managers in industry are constrained by "bosses and budgets", rather than by lack of technology, knowledge or their own ethics, to act responsibly. This points to the ambivalence of environmental management in practice, pursued further in chapter 10.

A site visit by Bosman in January 1996 (noted in the Forum correspondence, 1997) identified ammonium sulphate in water released into the Leeuwspruit (which flows through the densely populated township of Boipatong). A week later DWAF pointed out to ISCOR that it had no permission to release contaminated water into that water course. In the DWAF notes on file, ISCOR's replies to these warnings are described as "incomplete", and part of a "devil-may-care" attitude to a pattern of ongoing spillages. These notes in the DWAF archive indicate a high level of frustration with ISCOR's lack of compliance (undated, handwritten note).

DWAF again reacted sharply to the discharge of untreated effluent to the Rietspruit in February 1996, water leaching from the dumpsite onto smallholdings to the West of ISCOR in April 1996, and another incident in December 1996. The December incident led to a press release by Bosman (1996, Dec 23). It is an interesting cross-over by an official from the regulatory arena, which is the arena in which the primary actions were taking place, to the arena of the public media. Its origins do show in the factually precise official language, which at the same time present a well-constructed argument to the general public. It constitutes a public confrontation with ISCOR about its pollution:

> "The Department of Water Affairs and Forestry received a complaint that possibly polluted water from the ISCOR Works Vanderbijlpark was leaving the property at its north western corner.

> "Only unpolluted storm water runoff is allowed to leave the company's premises at that point, after which it flows via a storm water channel through the smallholdings of Steel valley and Linkholm, and into the Riet Spruit.
>
> "The Weather Bureau said that no rainfall was recorded in the surrounding Vereeniging area for two days preceding the allegation, reported by a concerned citizen.
>
> "The Department, accompanied by a police officer from the endangered Species Protection Unit, held an investigation on Saturday 21 December. Samples of water, from where it leaves the premises and water inside the property were taken for analysis for possible legal action.
>
> "The pump station responsible for pumping possibly contaminated water back into the company's water management system was not operating at the time of the investigation. As soon as results from the analysis on the water samples are available, the Department of Water Affairs and Forestry will consider further action" (Bosman, 1996, Dec 23).

The departmental correspondence also quotes complaints from ISCOR's neighbours about pollution of their land. This indicates that these complaints, which at this time just started to become persistent, did now play a role in drawing DWAF's attention and motivating them to act. This was a radical change from DWAF's past behaviour. The notes indicate that by May 1996, plot owners were forced to dig furrows to protect their lands from effluent laden with ammonia and sulphate. The overflow was dark brown and had a smell of tar or oil and burnt the skin. It was widely believed to come from an area of the steelworks which was so polluted that it was described as the "Siberia" of ISCOR. Borehole water at Steel Valley Plot No 68 contained tar or oil. Residents reported that there was a white precipitate "everywhere": on the roads, in the veld, on the houses and in their gardens. Some roads wholly washed away. The groundwater table was observed to be very high, and there were pools of standing water despite the fact that it had rained last a month before. The farm Rietkuil - about 23 hectares - had abandoned agricultural activities because the plants died and the animals had become sick. Apparently, DWAF was ready to then take ISCOR to court for non-compliance (Barnard, 1997 May 12).

Working with the polluter

DWAF decided in all these cases not to prosecute, but to "work with the polluter". Explanations for this decision are given in documents with much later dates, which may indicate a rationalization post hoc, but can be argued to articulate DWAF's thinking at the time. In a background memo "Progress in Environmental management: ISCOR Vanderbijlpark Steel (IVS)" (DWAF 2003, Sept 26) the then regional director offers the following argument to the director general after criticism that the department's enforcement actions are poor, and that the department avoids prosecuting ISCOR:

> "…the Department could have opted to take legal action against IVS instead of walking the route with them, guiding them, making sure that they determine the extent of their impacts, sort out their infrastructure to be in compliance with current legislation and rehabilitate impacted areas. On the one hand, the first option (if successful) could have resulted in a small fine for example R500 000 being imposed on ISCOR with huge amounts of resources (time and human resources) being channelled into the legal processes rather than the actual problem. On the other hand, the route that the Department has opted for has resulted in IVS committing in excess of R1,2 billion to address the situation. Looking at the bigger picture, this is seen as a success by the Regional Office."

It was a decision to discipline the polluter through ongoing pressure and advice, which was implemented through a series of bureaucratic decisions over the next few years. A chief instrument for this was the application process for water use licenses. The decision may also indicate the rational calculation of officials that ISCOR may prove a doughty opponent in court, with possibly superior legal and financial resources, that could tie the state up in years of litigation. The effect of this perceived imbalance of resources will be explored in the next chapter, where ISCOR's use of legal strategies is considered. DWAF's choice to "work with the polluter" was consistent with the historical regulatory approach explored above (chapter 5), including the regulator's internal weaknesses discussed above. It is possible that DWAF's early step-down gave a signal to ISCOR (a private company since 1989) early on in this dispute, that it was safe from government

prosecution, and thus served to harden its approach towards its neighbours in Steel Valley.

Not everyone shared the view that the powers of the department to fight pollution were weak, even before new Water Act of 1998. In 1997, Duard Barnard, environmental lawyer, argued in a letter to the Western Gauteng Services Council (Barnard, 1997, May 12) that in terms of the Water Act of 1956, DWAF may direct that the supply of water to ISCOR be suspended, which he observed would be a useful tool in negotiations. Another threat in terms of the same law (section 22A) empowered DWAF to repair the pollution damage and send the account to ISCOR. Again, Barnard saw this as a useful negotiation tool.

In 1998, a new Water Act replaced the 1956 water law. The state became the custodian of South African water, on behalf of the people of the country, removing the ownership rights of riparian owners (those who owned the land forming the banks of rivers). All water users could therefore be regulated, in regards to volume used as well as quality of water discharged. The 1998 Act sharpened the legal instruments for dealing with pollution which had already to some degree been present in the 1956 law. It defines pollution as changing the physical, chemical or biological properties of water to 1) make it less fit for a use that can be reasonably expected, and 2) make it harmful or potentially harmful to human beings, organisms, water quality of property (Water Act 1998, chapter 3, section 1). It imposes a duty on industries, among others, to take all reasonable steps to prevent pollution from occurring, continuing or recurring. This includes dealing with "historical activities or processes which cause or may cause water pollution" – because it would constitute continuing pollution. This duty includes remedying the effects of previous pollution (Sampson, 2001: 63). In section 20, the operators as well as anybody with knowledge of a pollution incident, must report it. The responsible person must take all reasonable measures to contain, minimise, clean up and remedy the effects of the incident. As before, government measures to clean up may be required to be paid by the polluter, or any person benefiting from the pollution or the clean-up, and a court may award damages, remedial measures or the cost of remedial work.

Exemption 1998B

This permit exemption 1998B (water use permit) shows the approach of "working with the regulator" in detail. The exemption permits ISCOR's water withdrawals up to 31 December 2001. DWAF strategic documents for exemption (water use licenses) discuss the reasons for conditions set in water use permits. The strategic document responding to the application for Exemption 1998B argues that the granting of the license "must not be taken as the relaxation of the…department's policy and principles, but as a management decision in order for the Works to address its problems adequately" (DWAF, 1999, Sept 1). The temporary impact from ISCOR (caused by some relaxation of standards in the law that are suggested in the document) will "be mitigated by continuous improvements up to 2005. This will have a positive impact on the current situation because they have committed themselves to become a zero discharge facility when the specified improvements have been completed" (DWAF, 1999, Sept 1).

The document gives a short pollution history as background, revealing that ISCOR had been without an effluent release permit since 1995 (for four years); in the interim working according to the requirements of its previous Section 21 permit. This reveals a lax relationship between the regulator and a major industrial water user. The background document reports on progress in the management of pollution at ISCOR, and looks at five anticipated improvements to water quality in the period 1998 to 2005: an upgrade of the central effluent treatment plant, completion of the inorganic effluent treatment plant, commissioning of the organic effluent treatment plant, the re-use of south mills effluent and implementation of buffer dams at the steelmaking area. However, it also relaxes the standards for electrical conductivity, chloride, sulphate, sodium, fluoride, ammonia, manganese and nitrate concentrations in ISCOR's effluent (DWAF, 1999, Sept 1).

There are indications that DWAF's requirements for ISCOR's water use were becoming more stringent. The 1998B exemption included target dates for the completion of buffer

dams, effluent treatment plant completion, upgrading of the Central Effluent Treatment Plant, and a programme to reuse the South Mills effluent within ISCOR, all set for 31 December 2001. It also set the deadline of 31 December 2005 for completion of an IETP/TETP effluent treatment facility. Other conditions were imposed, for example limits on manganese levels. A bio monitoring and expanded heavy metal monitoring program was scheduled to be in place by (DWAF, 1999, Sept 1). Various studies had to be undertaken, for example of irrigated areas in Greater Steel Valley, and groundwater had to be monitored – for total phenolic compounds and total poly-aromatic compounds (although no standards appear to be set). The next exemption would then be granted in early 2002 (although in the event that process overshot the deadline and a permit application process with public participation took place in 2003, discussed below in this chapter).

The background document shows that the Department of Water Affairs did embark on stricter regulation, while taking into account historical backlogs as well as the current technical limitations of ISCOR. It would be interesting to have seen how these negotiations took place and how much the department was accommodating ISCOR to the detriment of the environment, and would make a good study of regulation in practice, outside the scope of our current study.

The more stringent regulation of ISCOR seemed to have an impact. In July 2000 DWAF complained that ISCOR was not complying with its new water permit. Patrick van den Bon, ISCOR's environmental manager, replied that the new conditions of the 1998B permit were stringent and resulted "initially in an apparently lower level of compliance with regards to effluents to Leeuwspruit and Rietspruit". Van den Bon immediately reassured DWAF that "more importantly, the following measures are being executed which will result in a significant reduction in total salts discharged and expected compliance as regards conductivity, sulphates, chlorides and sodium from the end of December 2000… These measures will also reduce fluoride and manganese levels such that these will be compliant or close to compliance from the end of December 2000." (Van den Bon, 2000, July 11, letter to DWAF). ISCOR was still in a relationship of

"negotiated non-compliance", as Bobby Peek from the NGO groundWork has characterised the South African regulation system (personal communication, 2008).

The approach of managing ISCOR's pollution via conditions in its water use license continues in the 2003-2006 water use license. In the preparations for this license, officials appear to plan to closely manage ISCOR's water use for achieving certain targets. Conditional exemptions are tied to refurbishment and construction targets (DWAF, 1999, Sept 1). One condition (1.11) was that ISCOR should achieve Zero Effluent Discharge status by December 2005, as previously agreed with the department. The license prescribes water quality parameters for storm water and overflow discharge into the Leeuwspruit (via the Frikkie Meyer weir on the Boipatong side), as well as a much larger volume (maximum of 10 950 000 cubic metre) and more accommodating quality requirements into the Rietkuilspruit via a canal, for example on fluoride. The parameters for both note that, in case of an exceedance for total chromium, specific analyses need to be done for hexavalent chrome (the form specifically dangerous to human health). Another condition was that disposal on the old slag dump should cease by 31 December 2010, and a new slag dump permitted through an EIA process. Conditions include closure and/or rehabilitation of various evaporation ponds and maturation dams. Dam 10 is to be taken out of use. Some relaxations are granted to accommodate work on the terminal effluent, and central effluent. A bunding system for the whole works area is prescribed. An extensive monitoring system is prescribed, including phenols and heavy metals. Six monthly bio-monitoring and quarterly whole effluent toxicity testing are also prescribed. Every six months, groundwater monitoring needs to be undertaken at a number of points both inside and outside the works area. In addition, ISCOR is instructed to establish a groundwater model to predict the long term impacts and groundwater contamination plume (by July 31, 2004) and prepare remediation options and remediation plans before 31 December 2004. Protocols for describing malfunctions and incidents of water pollution are also prescribed, as well as the duty to prepare a storm water management plan. A public consultation process during the licence review period up to 31 July 2005, though independent facilitation is also prescribed – presumably with an eye to renewing

the license for the following term (DWAF, undated and unsigned draft 7 of the 2003-2006 license).

What emerges is a very detailed management system which reflects a detailed knowledge of ISCOR's effluents and constraints, and is the outcome of ongoing negotiation between regulator and water user. For example, the regulator seems aware of ISCOR's difficulties in achieving the fluoride standard, and in the 2003 license, the standard is somewhat relaxed. A consideration that returns in arguments about relaxation is that Steel Valley is now no longer a residential and agricultural area, so that effluents do not have the same deleterious impact on the receiving environment!

This system was framed, on the one hand, by the water use license conditions which ultimately derived from water quality policy (receiving water quality approach) and the general standards, which determined how much pollution was acceptable in the effluent. An equally strong, if not stronger framework, was a horizon of environmental management improvements that ISCOR had concluded were necessary. The process for these decisions was the ISCOR Master Plan. Most of our discussion on the Master Plan will be reserved for the next chapter, as it was a major pillar of ISCOR's response to the pollution challenges it faced. However its genesis is introduced below.

The Master Plan

For DWA, there were clear links between its authorizations, like water use licenses, and the Master Plan. In an internal progress report (DWAF 2002, July 22, part of the documents gathered for the court case High Court of SA, 2001), 11 elements were listed that had to be addressed by the Master Plan. This included the 2005 Zero Effluent status, rehabilitation of the slag heap, a reduction in volume of water used, rehabilitation or phasing out of maturation dams and evaporation ponds. These are also the elements for DWA's management of ISCOR through the conditions in the water use licenses. According to this report, the origins of the Master Plan lie in a 10 year "Strategic Water

Management Plan" presented by ISCOR to DWA in 1996 already. This plan was subjected to a gap analysis. The results of this analysis provided the basis on which the Master Plan was formulated (DWAF 2002, July 22).

The Master Plan remained a crucial framing document in ISCOR's negotiations with DWAF about its pollution throughout most of the period under study. The Master Plan studies were initiated in July 2000, and physical investigations took place in the rainy season of 2000. In a progress report on the Master Plan by Ockie Fourie Toxicologists (2002, July) it is reported that the baseline studies would take 24 months. Of interest is the intention to undertake thorough investigations into sources of possible pollution, including evaporation dams, holding dams and soils within the Works, slags, sludges, dust and other material being disposed of. By rights, these investigations would have provided clear evidence of the nature, extent and sources of ISCOR's pollution. However, they were framed in a continuance of the information protocols established in 1961 (see chapter 5), because the information would only circulate in a protected circle of officials and ISCOR managers. It can be argued that this shows that the institutional culture of the department continued unchanged and thus remained a pattern within the pollution dispositive: protecting information that could be used by fenceline communities to protect themselves from the externalisation of pollution onto them.

A number of capital expenditure projects flowed from this plan: dredging of Terminal Effluent Treatment Plant (TETP) buffer dams, upgrade of coke ovens effluent system, management of waste disposal site (and application for closure and creation of a new heap), the Central Effluent Treatment Plant (CETP), Dam 10, organic effluent treatment plant, and inorganic treatment plant, leachate management infrastructure, re-use of south mills effluent, water control centre. These points re-emerge in later discussions.

ISCOR insisted to government that the information it provided to DWAF in license applications should be confidential. The Master Plan had become the main depository of all the technical information about ISCOR's pollution, and the technical information of license applications. The Master Plan thus succeeded in replacing the ordinary and public

documentation for water licenses in a special process controlled by ISCOR, and protected by the "principle" of commercial confidentiality. It can be argued that ISCOR had a great interest in keeping this plan secret. Its dilemma was simple: if it proposed ways of dealing with the pollution, it would have to produce scientific evidence of the nature and extent of the pollution, but… it had always denied the existence of and responsibility for this pollution. The absurdity necessitated the secrecy: the document would explain in great detail how ISCOR would fix the pollution which, in the forums and legal arenas of the same time, it claimed did not exist and could not be proven!

In August 2002 DWAF received a progress report on the Master Plan. ISCOR again appealed to DWAF to keep the information secret, arguing that the information it was releasing to the state could be used against it in a court case (see next chapter) (ISCOR, 2002). This argument is interesting in two assumptions it makes:

1. That the state should aid ISCOR in keeping information away from citizens which citizens could use to establish liability for health and other damages done to them, and thus gain compensation. Why should the state be expected to side with a corporation against its own citizens?
2. That if the state did not guarantee such secrecy, ISCOR had an option not to provide the information. If ISCOR decides which information it will and will not release, it implies that ISCOR has the right to mislead the state and the public about its pollution, even though in doing so, it contravenes a constitutional right.

DWAF agreed to keep the Master Plan confidential, and therefore became an ISCOR ally in its information manoeuvres against the people it was polluting, and an obstacle to justice, rather than a facilitator of it. Since 1997, and the decision to "work with" ISCOR, DWAF developed an official position that, because of its own efforts and pressure on ISCOR, ISCOR was improving its environmental management. This explanation was given to parliament in 1997, and repeated in responses to media reports. This had far

reaching consequences in lending the state's legitimacy to ISCOR, as discussed in more detail below.

2003 water license

As part of its ecological modernization drive, the department now also insisted on more public participation, as a license condition. This was inscribed in the licenses, and was also a requirement (as a result of the EIA legislation) for the specific EIAs that emanated from the Master Plan, but were run as separate processes. In the department's internal correspondence, public participation in the 2003 water license process was discussed intensively.

A closer examination of the 2003 water licence application process shows the strong limitations of public participation. For an analysis of how discursive power works, public participation processes are very revealing. On the one hand, public participation has the form of a free and reasonable exchange of information and opinion. The public is invited to participate in the reaching of a decision, by considering a proposed development, reasons for it, alternatives to it, and objections to it. However, the influence of the public on decision making can be very limited.

Public participation in the 2003 water license pronounced its own verdict on the processes from the side of the Steel Valley community. After considering the license application, the community participants provided two conclusions in this public process. It expressed its opposition to granting ISCOR a water license at all, and complained about the knowledge politics in the process. It pronounced: "We the committee consisting of members of the public delegated in a public meeting:

> "… are of the unanimous opinion that the Licence should not be renewed until it is proven that ISCOR can fully comply with its conditions.

> "That the withholding of crucial information contained in the Master Plan and application was purposely done to hinder or make it as difficult as possible for the committee to access other information… the Master Plan document was continuously being held as an excuse in past meetings to the Task Team to evade questions put to ISCOR and government to allow unrestricted latitude from prosecution for environmental pollution and licence conditions contraventions" (ISCOR Water Permit Evaluation Committee, 2003 Sept 11a).

Since the committee was convinced that their evaluation would be ignored and the licence granted anyway, they added a list of conditions that would make the approval of the license "only more acceptable but not accepted". Some of the conditions are already legal requirements, such as monitoring and swift reaction to pollution incidents, which makes it clear that in the eyes of the community, the law is not implemented. However, some of the concerns, based on the technical knowledge and detailed experiences of past non-compliance as observed by the community, did make it into the final license, which could be described as a limited victory for the participation process (ISCOR Water Permit Evaluation Committee, 2003 Sept 11b).

The double answer that the Steel Valley residents and other public parties gave illustrates the double nature of the participation process. On the one hand, if the committee had the power, they would use the refusal of a water license to force ISCOR to comply with environmental management – not even Environmental Justice – demands. On the other hand, since they knew they did not have that power and were merely being consulted, they provided a list of conditions to mitigate the environmental impacts. The participation arena held limited power. Almost anything could be said, but the impact of such discourse was predictably limited, because the state would not shut ISCOR down and ISCOR knew it. The public parties also clearly recognized the Master Plan as a ruse and an excuse to withhold pollution information from them.

The DWAF Forum – a platform created by the state

A very different role of the state was to create platforms for the resolution of the pollution conflicts. As noted in the introduction to this chapter, both polluter and polluted appealed to the state as arbiter. In turn, the state, as political authority, could not allow the situation to continue without an intervention. To do so would undermine its claims to legitimacy, for example the constitutional right to a healthy environment. The state intervention followed on a number of initiatives undertaken by both the community, through their local political representatives and ISCOR. A short history is given based on available documentation to illustrate how the state was responding to pressures from below.

According to ISCOR correspondence with the department (ISCOR, 1997 March 24), the earliest pollution forum dated from before 1995, where ISCOR met with representatives of the "Driehoek Hoewe Organisasie", which was reorganized to include representatives of the Vaal River Representative Council and the Western Services Council Gauteng (WSCG). According to Felix (interview, 2006) the WSCG had engaged ISCOR, which is consistent with this history. This "ISCOR Pollution Forum" included not only ISCOR and the Western Gauteng Services Council, but also the Department of Water Affairs and Forestry, the Vaal River Representative Council, the Gauteng Department of Agriculture, Conservation and the Environment, and various local residents. From the side of the residents, the ISCOR Forum involved an investment of high levels of effort and energy. "Things became heated in forum discussions", recalls Danie Lingenfelder, chairperson of the Louisrus Interest Group: "The reeds were shaking during all night sessions. We often talked through the night, but we achieved absolutely nothing. The ISCOR people in the forum never had a mandate to help us" (interview, Oct 2005). Residents complained that these ISCOR officials never had enough authority to make any decisions.

ISCOR reported to DWAF that "this forum is now looking into the feasibility of a number of proposals such as the supply of potable water, installation of infrastructure,

etc." (ISCOR, 1997 March 14). ISCOR was therefore willing to negotiate short term solutions with the community (as requested by DWAF) as well as implement a 10 year water plan which it had already submitted to DWAF (the water plan that, after a gap analysis, became the Master Plan as discussed above).

Minutes of a 24 March 1997 public meeting, signed by councillor Neville Felix, give an insight into the situation and the negotiation of short term solutions. A Mr A Brown, who had been asked by the WSCG to evaluate information provided by ISCOR, noted that ISCOR "had a good grasp of the problem but were still in the process of developing solutions". Brown revealed a number of facts about the pollution: the salt (inorganic) pollution plume was moving faster than the organic pollution plume in the groundwater, and had already moved 1,5 km from dam 10. There was sporadic evidence of high nitrate levels (WGSC, 1997, March 24). The possible solutions were to tanker in water, to pipe in water either from ISCOR or through a Rand Water connection, to establish a groundwater purification plant (which would cost more than R10 million with a high running cost), or to use bench type purification works. Costs of installing sewer infrastructure were also discussed. It is at this point that an unsourced remark "by the community" is recorded, namely that "these solutions are very expensive medicine for a horse that is going to die anyway" (WGSC, 1997, March 24).

The meeting demanded the presence of senior ISCOR and government officials at the next meeting, set for 3 April, to provide answers to these questions. At this stage, the initiative seemed to be with the WGSC on behalf of the community. ISCOR management responded to these demands and a meeting on 9 April was attended by high level ISCOR officials. Also in April, the WGSC launched a campaign to have Steel Valley declared a disaster area because of the serious threat the pollution posed to human health, the environment and economic activities. This request was turned down by both the provincial and national governments.

The new minister of water affairs, Kader Asmal, became involved in the issue in 1997. In a letter, DWAF told ISCOR that it was "an undeniable fact, elicited from several

geohydrological studies, that ISCOR is polluting the groundwater", and demanded immediate action (a reply within 7 days) "to prevent possible health risks in the affected community" (DWAF, 1997 March 7).

ISCOR replied (Rautenbach, 1997) that it had instituted a community forum in 1995, and that the groundwater issue was more complex since it included bacteriological pollution from a combination of a high water table and deficient French drains (that ISCOR argued had not been the result of its activities). It can be argued, as Bosman did in chapter 5 above, that the high water table, contrary to ISCOR's argument, had in fact been caused by ISCOR as documented in the 1988 SRK report (High Court of South Africa, 2001). It would be the result of the large quantities of water imported into the ISCOR works area and allowed to reach the water table through unlined dams (like dam 10). It can moreover be argued that this issue has since been used as a red herring to pull attention away from the industrial pollution (Bosman, personal communication, 2009). However, ISCOR concluded that it was "fully willing and committed" to negotiate short term solutions with the community and implement a 10 year water treatment plan.

In December 1997 the Minister of Water affairs and Forestry instructed that a cost-benefit analysis (CBA) be done under the auspices of the DWAF Forum, to investigate a feasible solution to the pollution problems which should be funded by ISCOR. The study's results would be presented to the forum (Asmal, 1997, Dec 5).

The first meeting for the CBA process was held on 30 September 1998 (L&W, 1998, Sept 30). The CBA's brief was to provide information that would inform the Steering Committee of the Pollution Forum whether 'buy-out' or 'remediation' options were viable. The 'buy-put' option referred to the purchase of all affected properties, while the 'remediation' option referred to the rendering of affected resources to a condition suitable for use by residents of the greater Steel Valley area (including the repair of houses, soil rehabilitation and the installation of water for domestic and irrigation uses).

Discursive power in a cost benefit analysis

The cost-benefit analysis was expressly intended as a decision making process. There are a number of particular characteristics of this process which reveal the power relations within which it framed this decision making process. The study was framed in terms of two contending options. It explicitly excluded identifying the cause of the problems: "The CBA was not designed to assign responsibility for contamination or to identify the source of the contamination." (L&W 1998: 13). The cost-benefit analysis thus proceeded in a curious vacuum without any reference to the "polluter pays" principle. A further result of leaving out the "polluter pays principle" was that proper remediation was defined out of the decision making framework from the start. This is explored further below.

The study acknowledged some of its immediate limitations flowing from its limited time span of ten weeks – compared to the 24 months that the Master Plan was afforded:

> "The consequences of the short time frame allowed for the study is the following:
> - The nature of the problems within the study area could not be defined fully.
> - The present and future extent of impairment of the environmental resources could not be reliably defined.
> - The extent of contamination of variables of concern such as metals and organic constituents that were being identified as being present in the groundwater could not be confirmed."

In addition,

> "…specific attention is drawn to the possibility that the area and nature of restoration which may be required could be substantially different from that assumed for the purposes of the study due to the uncertainties listed above" (L&W, 1998: 12).

The main purpose of the study was to make an immediate choice between two options: "buy-out" and "remediation". How these two options would be constructed would

determine the future of Steel Valley, as the forum was, at this stage, backed by the state and, to some degree, legitimized by the participation of Steel Valley residents.

The "buy-out option" was defined as "the purchase of all affected properties so those residents can continue a similar lifestyle elsewhere". This definition suggests the progressive definition for relocation developed by the World Commission on Dams (2000): prior, fully informed consent that places communities in the same or better position than before the move, but without building the required disciplines into the process. Another crucial elision is whether the state or the polluter would conduct the buy-out, and how?

The calculation of the buy-out option came to a total of R50,1 million. It consisted of property purchase (63% of the costs), compensation for moving, but not compensation for health and other costs (18%), interim measures for services (13%), demolition and salvage (3%), income loss (3%) and social costs (to non-landowners, that is measures to deal with farm workers) (1%).

The total cost of the "remediation option" was a very similar but slightly higher R59,7 million. This option calculated the need for two water systems: the installation of domestic and irrigation reticulated water systems (40% and 11% respectively), presumably because groundwater could no longer be used. The "irrigation water" option was limited to providing water via reticulation for livestock and domestic use, unless "bench scale water treatment units" could be used to provide irrigation water as "water-purifying units that are attached to the existing water systems in households". The installation of sewerage in the form of composting toilets was recommended (11% of the cost in this option). Soil rehabilitation and bacteriological decontamination would each cost 4% of the sum, interim measures 6%, repair of houses 5%, feasibility costs were 3%, additional maintenance costs were 11% and income loss would be 4%.

The "remediation option" was not based in remediation as this is commonly understood. It would be more accurate to describe it as a set of short-term measures to allow residents

to stay on in an unrehabilitated contaminated environment. The definition of the "remediation option" narrowed the term "remediation" to rendering of affected resources to a condition suitable for use by residents.

In developing the "remediation" option, the CBA used a concept of "high costs" to limit what would be technically feasible. This is puzzling, unless the underlying logic was to get the two options to be of the same order in monetary terms. The study argues the case for containing costs where it sets the standards "for remedial measures required to restore the contaminated areas to a state suitable for residential and agricultural use… The stricter the standards are the more expensive will the remedial cost be. It was therefore deemed to be important to establish defensible standards at the outset to provide a consistent goal for options to be measured against" (L&W, 1998: 19). But even these standards could be suspended, as the study continues to further define: "Areas where the … standards are not presently met, or where these standards are unlikely to be met in the future were designated as unsuitable for residential or agricultural use" (L&W, 1998: 19).

The actual remediation of the eco-systems, particularly the groundwater, is considered under "long-term restoration of the damaged environmental resources" (L&W, 1998:7). Together with another residual category "social costs justifying restitution", these apply to both options. The separately treated restoration and restitution amounted to R83 million together. This included ground water restoration at a surprisingly low amount of R41.9 million when compared to the estimates of R1 445,3 million in 2004 in the Master Plan discussed in the next chapter – a difference of more than a billion Rand! It also included medical costs and a medical trust (R27.2 million). The CBA Main Report argues the case for the medical trust in the following terms:

> "The most significant social cost could be that of the establishment and operation of a medical fund, which would offer relief to the community. It will be difficult to prove liability for this cost. However, consideration may need to be given to funding such a facility without necessarily accepting liability. The purposes of the fund is (sic) as follows:

- the payment of medical examinations to determine the problem and whether it is caused by the contamination (not only from water, but also air and soil);
- the payment of medical costs to treat the medical illnesses caused by the contamination;
- assisting the community in medical problems;
- the payment of medical aid subscriptions;
- The payment of compensation for past medical problems caused by contamination" (L&W, 1998: 7).

Notwithstanding its clear political and social engineering intentions, the cost-benefit analysis claimed authority for itself not only from the state, but from its scientific approach. Nine "specialist studies" provided the scientific foundation, including a groundwater overview, a study of agricultural and soils implications, a study of livestock and veterinary implications, an ecological overview, and a study of legal implications.

The two options were evaluated in terms of three criteria: cost, implementability and social acceptability. The study, completed in November 1998, found that while both could be implemented and the differences in cost were small (R50.1 million for buy out and R59.7 million for remediation) "plot owners generally favoured the buy-out option over remediation, despite regrets over loss of social fabric" (L&W, 1998: 4). However it was acknowledged that "the buy-out option will have an impact on labourers who may not be able to move and retain their employment with landowners when they move. Most employers felt that they were not responsible for the fate of their workers. It is estimated that some 450 labourers and dependants would be affected by the buy-out option. Most are aware of the contamination problems but are ill prepared in the event of a buyout. Low levels of skills and high levels of unemployment in the surrounding areas will make it very difficult for workers to find alternative employment". (L&W, 1998: 35). When the results were presented in November 1998, they were questioned by the community.

The results were not clear in assigning responsibility for the pollution, but did indicate that Steel Valley was polluted:

> "Three main types of groundwater contamination occur in the area. Organic and inorganic contamination probably originates from the ISCOR works and bacteriological contamination probably comes from French drains occurring throughout the agricultural holdings. Analyses confirmed that inorganic salts, volatile organics (including naphthalene, benzene complexes and halogenated hydrocarbons) and semi-volatile organics are present in the groundwater which is extensively used for domestic and agricultural purposes. The organic contamination of the groundwater includes hydrocarbons that range from innocuous to toxic in their possible effects on human, animal and ecosystem health (L&W 1998: 2).

The raising of the groundwater table had already been noted in the 1960s, and commented on by DWAF (High Court of South Africa, 2001, Heads of Argument: 33). It was a result of the huge volumes of water flowing through the ISCOR works. The raised water table meant that the VIP toilets – there is no other sanitation in the area – were now draining into an artificial wetland, an untenable situation. Maps (for example Fig 7.1) drawn at the time showed the area affected by bacteriological contamination to be right adjacent to the steelworks. This is consistent with the effect of large volumes of extra water brought into ISCOR and then draining away via the evaporation dams and other leaks to the groundwater. The report continued:

> "Soil productivity has been negatively affected by salinization, possible organic contamination and waterlogging… In conclusion, almost the entire study area (the Greater Steel Valley), has polluted groundwater or soil, which without remediation renders the area unsuitable for human habitation" … The map of polluted soils (see fig 7.1 below), shows the contamination of the soils to focus around the Rietkuilspruit and the Rietspruit canal areas in Rietkuil and Louisrus. Even soils that were not irrigated from the canal suffered salinization. The land along the Golden Highway had been salinized by seepage and surface run-off from the steel works. According to the report, spills and floodwaters are also likely to have contributed to the contamination. (L&W 1998: 23).

In response to the findings, the meeting in November 1998 (WGSC, letter to Minister Asmal, 1999, Jan 19) passed resolutions that:

- Greater Steel Valley be declared a disaster area, that a plan should be drawn up to remove the occupants as soon as possible, and that ISCOR should pay for it. The CBA just confirmed earlier investigations that the area is not fit for human habitation.
- A public meeting is held where CBA and solutions are considered. The public meeting supported a buy-out option AT REPLACEMENT VALUE (with the exception of 14 people who wanted further negotiations)
- If there was no response from ISCOR within 14 days, documents should be handed over to the public prosecutor (a new position created after 1994).

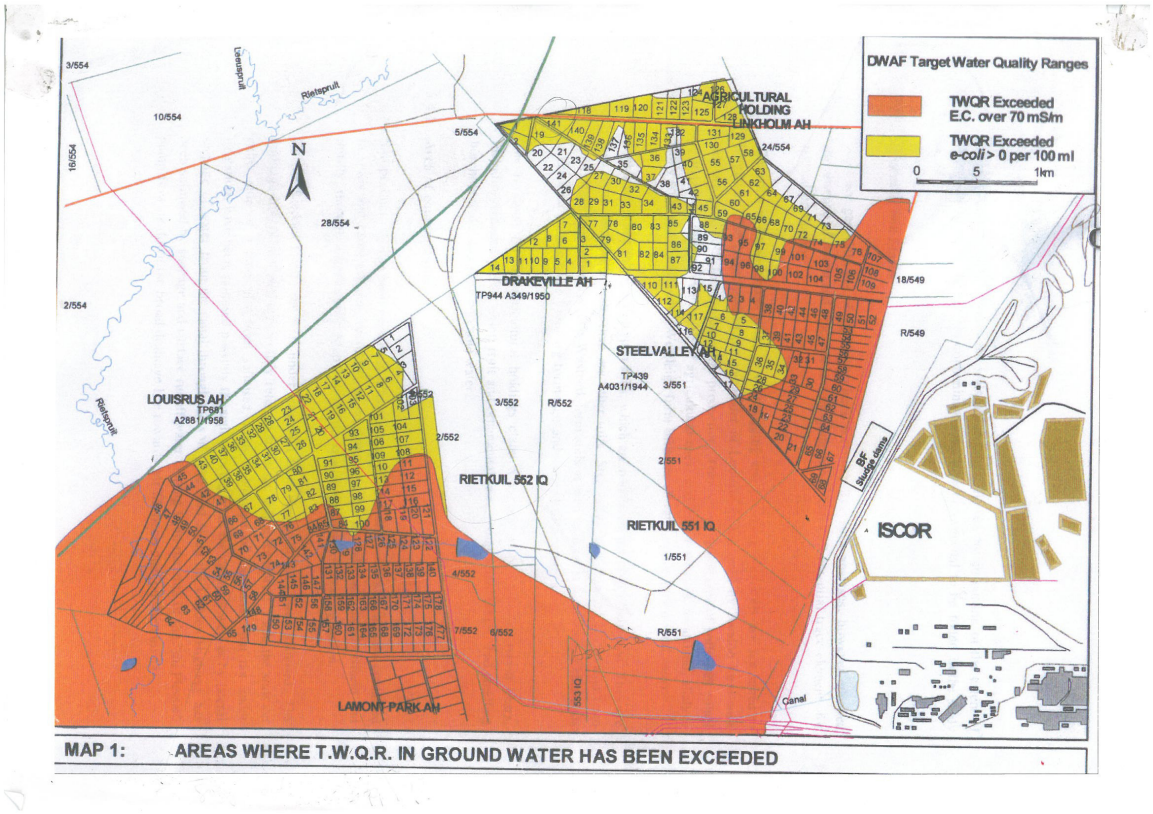

Fig 7.1 Map used as basis for buy-out, showing both faecal and salt contamination. From Steel Valley forum documents.

Felix's interpretation was that the cost-benefit analysis fully supported the concept of removing people as a community and also subscribed to the idea of a medical fund in the terms of reference of the report (L&W, 1998:7).

Then DWA Minister Kasrils was given the cost-benefit analysis. He instructed Gauteng Member of the Executive Committee (MEC – a provincial minister) of environment at the time, Mary Metcalfe, to close down the Forum, recalls Felix. "She said that the minister would manage the issue with ISCOR directly. The minister called us to the airport to a hasty meeting, where he told us that he had instructed his department to manage the process. We were heading to the next (2000 local government) election."

This indicates that initially the community was able to call on the state. The state initially took a firm stance on the existence of the pollution. That firm stance became diluted in the CBA – possibly for no more than tactical reasons, as the thread of earlier evidence was lost. What needs to be explained is how it happened that the state, with extensive documentation of ongoing Iscor pollution in its possession, did not intervene in a forum that it had established itself? But ISCOR's refusal to accept the outcome apparently left both the state and the residents helpless. Subsequent events showed that the forum had no binding authority.

After the forum

The first fall-out from the forum results, and ISCOR's refusal to accept them, was the Johnny Horne case, discussed in chapter 8, where together with ISCOR's reaction to the cost-benefit analysis.

Public meetings, the main platform for the community, on 25 November and 5 December came to a list of conclusions for future action, appealing to parties to execute these, but were "powerless". So, at that stage (January 1999), both parties appealed to DWAF. In the background is the suggestion of a liability, that could be apportioned, and lead to

financial liability, compensation for damages, and remediation, but is not legally binding as the outcome of the forum's CBA, or as a DWAF directive in terms of the law (which it could have been), and a threat of legal defence from ISCOR, who was at that time in court with more than 60 landowners in the Johnny Horne case.

ISCOR argued that, due to the Johnny Horne litigation, it could not continue in the forum. In October 1999 ISCOR requests DWAF to guarantee the confidentiality of its pollution information, "while the litigation process is continuing". This would become a big issue around the Master Plan (below). DWAF official Ephraim Matseba proposed a process, driven by WGSC and funded by ISCOR, to determine liabilities (on existing information, or an independent investigation) with a commission of enquiry as a last resort, to decide between a buy-out or expropriation. It was noted that (only) 14 people were not willing to sell.

The collapse of the DWAF Forum gave ISCOR a free hand to negotiate with individuals, says Felix. The area was now redlined by the banks. According to Felix, "Individuals then just decided: 'Let me take what I can get out of the process and get away.' " (Felix interview, 2006). ISCOR proceeded to implement its own version of a buy-out. DWAF let ISCOR escape from the forum. In other words: not heeding the forum was the turning point where ISCOR knew it would not have to take responsibility for the past, but only needed to "clean up its act" in terms of future pollution. Participation in the forum continued to the point where the buying out option was considered by the majority of inhabitants as the solution, but with considerable anxiety about what the buy-out prices would be, and sadness and anger at the loss of community and livelihoods, as well as medical costs coming in future, and an idea that compensation should be paid.

The buy-out and the Johnny Horne court case and the subsequent court case are explored further in the next chapter, focusing on ISCOR's strategy and the state's response to it.

Lending the polluter legitimacy

A number of state actions in this phase had the effect of lending the polluter the legitimacy of the state. One instance discussed here was a report which formed part of the process of selling ISCOR to Mittal Steel, and the other a strategic DWAF response to media attention in 2001, caused by a court case of a second set of Steel Valley residents who took ISCOR to court. Both show how the state, in defending itself, defended the polluter.

The Hatch report

Around 2000 preparations started for selling ISCOR (as detailed in chapter 8) to Mittal Steel. Due diligence demanded an assessment of environmental liabilities, carried out by the consultancy firm Hatch for the Industrial Development Corporation (IDC). This seemed to have turned on the question of the attitude of government officials towards such liabilities. If this is the correct interpretation, then the sale of ISCOR effectively bound government to a minimalist intervention and would eventually push it into becoming an advocate for ISCOR (and later Mittal)'s compliance to communities, the broader public and the media. The researcher has not seen the report, but reference is made to it in correspondence of the Gauteng Department of Agriculture, Conservation and Environment (GDACE). Officials in the department became suspicious when they were approached with questions about their attitude towards the environmental liabilities of ISCOR. The consultants preparing the report wrote to GDACE:

> "We were aware that ISCOR Van der Bijl (sic) had been under pressure from the authorities (DWAF, DEAT, GDACE) prior to the OFT (Ockie Fourie toxicologists, the lead team for the Master Plan) initiative, but we were told by ISCOR personnel and the OFT team that relations with the authorities had improved dramatically and the authorities were generally in support of ISCOR's environmental efforts and future intentions in this regard. This was entirely credible, but in order to round things off, we decided to call those representatives of the authorities who regularly meet with the ISCOR van der Bijl environmental management team and the OFT team in order to seek

> independent verification. Such telephone calls generally corroborated the improved relations claimed by ISCOR and the OFT team. Although your response would now be too late for inclusion in the final report by Hatch, we would still be interested in hearing from you" (GDACE, 2002, July 2).

From other correspondence it seems that the GDACE officials did not agree with that assessment. However, it is possible to read these references to the Hatch report as a discursive move, initiated by the Industrial Development Corporation anxious to sell ISCOR, as seeking a reassurance from South African officials to the overseas industrialist that he will not confront a serious environmental liability if he invests in the then ISCOR. This is an interesting topic for further research, not taken up in this thesis, but see Leonard's *Pollution and the Struggle for the World Product* (1988) for a study of how governments minimise environmental protection in order to attract international investment.

DWAF moves to closure under media spotlight – 2001

As Steel Valley residents gained media and public sympathy, DWAF found it politically necessary to defend its actions. The media publicised the case widely and continuously. When DWAF defended itself in the court of public opinion, the claims in its defence revealed the difference between what it actually did, and how it sought to portray its actions and their consequences under pressures to retain legitimacy.

In May 2000, Stefaans Brummer published the article "ISCOR poisoned our water" in the *Mail and Guardian* weekly (May 19, 2000). It prompted a response from the new Water Minister, Ronnie Kasrils, in which he expounded an "official position" which put DWAF's role in the best light possible (Kasrils, R., undated draft). The official position held that the new government had initially put pressure on ISCOR, but had then decided that the rewards of the legal route (when DWAF official Carin Bosman laid a charge in 1994) would not be worthwhile under old legislation (before the 1998 Water Act).

However, the department did succeed in putting important measures in place, and persuaded ISCOR to budget funds for these measures.

The minister said that steps taken by him (Kasrils) included that no pollution, i.e. no threat to human health, would leave the boundary of the ISCOR Vanderbijlpark plant. This would be achieving a major community objective, which is the end of pollution from the steel factory, if it were true. However, that would only be technically possible if the whole ISCOR site had been cleaned up, all infiltration into ground water had been stopped, or barriers to underground water movement had been built. The minister presumably meant that no new pollution would leave the steel plant's boundary. Even in this narrower sense, that would not be strictly true as ISCOR was operating in terms of a number of exemptions in its permit that did allow pollution in its effluent.

In terms of air pollution, Mittal is clearly still one of the major polluters, and air pollution blows over its fences to Boipatong. The Green Scorpions inspections (the Green Scorpions are an enforcement unit in the Department of Environmental Affairs) in July 2007 – at Mittal's other steel plant in Vereeniging - showed non-compliance in their waste management. Manganese and fluorides were flowing into the effluent and into the Rietspruit, Leeuwspruit and Vaal. Kasrils' claim that: "DWAF does not allow pollution in a permit as stated in your article. Allowable discharges are based on the requirements of users downstream in the Rietspruit and Vaal River "was only understandable in strict bureaucratic process terms.

Kasrils claimed as another success: "The implementation of rehabilitation by the end of 2001 and budgeting of funds for the above measures." Furthermore, "pumping and treatment of the pollution plumes was ensured". This seems unlikely as communities and other observers have seen no evidence of rehabilitation in Steel Valley. The buy-out strategy was claimed as a success. Kasrils claimed that DWAF had ensured that ISCOR had "a strategy in place which amounts to millions of Rands, of which the buy-out is the first phase ensuring that the above-mentioned objectives are reached." The Forum, which clearly failed when the polluter rejected its findings, was also hailed as a success, but

Kasrils claimed that the function of the forum had been "to ensure communication between ISCOR and the community, and implementation of a cost benefit analysis to determine the extent of the pollution." As was seen above, such determination had been expressly excluded from the cost-benefit analysis. Kasrils assured the public that the buy-out process would lead to rehabilitation: "As soon as the buy-out option is completed, the relevant steps can be finalised and rehabilitation can become a reality" (Kasrils undated draft).

A new court case against ISCOR brought by the 16 applicants' court case set off another round of media reports from February 2001. A story appeared in the *Mail and Guardian*, resulting from the serving of court papers headlined "Vaal community being poisoned to death" (*Mail and Guardian*, 9 February). Towards the end of the year *Beeld,* 30 November 2001 article written by Elize Tempelhoff, focused on the court case again. A new element was scientific evidence provided by the whistle blower, Pieter van Eeden. (This was discussed in detail in chapter 5.)

On 23 Feb 2001, there was a parliamentary question on the topic. The media flurry continued.

Minister Kasrils talked about minister Asmal's achievements in response to an article in the *Mail and Guardian*, 9 February 2001. The explanation reached back to the "small fine". However, this explanation, in terms of 1956 Water Act, of a fine of R50 000, had since been superseded by the possibility of cleaning up the pollution and sending the bill to ISCOR. Kasrils complained that the Steel Valley allegations are continually recycled in the media, while the regional office is doing its job and making progress.

More parliamentary questions followed as a result of the media attention. In response to a McIntosh/Moorcroft question, in May 2001, Kasrils declared: "I am satisfied with the amount of energy, commitment and dedication that have gone into resolving this situation in a satisfactory manner". He added: "It must therefore be stated that the environmental Master Plan as commissioned by ISCOR comprises a plan, a commitment and project

execution carried out and prepared in agreement with the Department and other stakeholders. Furthermore, it has identified and defined environmental legal obligations and developed and environmental management strategy and methodology as well as a program of implementation."

Here DWA gave the Master Plan the status that ISCOR wanted for it – a total and totalizing solution. It has succeeded in becoming – without public scrutiny or peer review – the government's own solution for dealing with ISCOR's pollution in Vanderbijlpark. With this strong position, DWA clearly intended to bring closure to the Steel Valley issue. But closure was not possible for Steel Valley residents

Johan de Kock was an ex-resident of Steel Valley and tireless campaigner for the restoration of his own and his neighbours' rights. In a letter dated July 2000 to the local government of Lekoa Vaal (Letter dated 12 July 2000). De Kock gives a picture of the results of the ISCOR buy-out. He complains that:

- "water is not being given to all remaining residents
- roofs etc. are removed but walls left standing of houses to be demolished, providing a place for criminal elements to hide and compromising residents' safety
- evaluation of properties for buy-out: de Kock argues that "this is a forced removal due to the pollution caused by ISCOR and the principle of ESTA should be applied, meaning replacement value for any improvements. Government Gazette no. 17773 dated 4/2/1997 section 11 (2) (a) should apply. The evicter must pay (because we have to move due to pollution)."

In August 2000 he writes another letter to DWAF's Marius Keet, asking

> "Do we have a bill of rights, or are some people just more equal than others?"

By then, there were around 40 houses left in Steel Valley. De Kock wrote:

> "Some are experiencing ill health and the end is not in sight. … Do residents of this community have to fund the right to live in a clean and safe environment as had to be

> done in the recent past? Why has government not yet instructed ISCOR to compensate the affected community? And is the new government now more concerned about black people than white people? If government can take the time to attend to the ESTA laws so vigorously for labour, why can they not attend to our problem? Is it because we are the wrong colour? The only laws invoked for our predicament was ESTA, and against the victims for being forced into a situation of relocating. No other law or decision was taken by government to alleviate the plight of landowners against circumstances beyond their control or doing. Does this mean that in the eyes of government it is okay to disrupt white owners but not others? This is classified as racism. And you practice it in spite of advocating to eradicate it!!!!! Can the remaining black owners also expect the same treatment? All I expect is the same treatment as the disadvantaged groups according to democratic rights, if we are included in the same bill. You must take note that our whole community support group has been destroyed by the actions of government and ISCOR. We are now bombarded with a multitude of scavenging people for scraps, and also have no visible policing. We are stripped of our property value and security because of the apathetic attitude of government that refuses to take action…" (De Kock, 2000 Aug 23).

By 2004 and 2005, DWAF showed irritation when community members like Johan de Kock continued his activism for his constitutional rights. When Johan de Kock wrote a letter to the president, Mr Thabo Mbeki, in May 2004, the DWAF became "concerned about the way in which the ISCOR pollution issue is being referred to various Government departments" while "no new evidence is being put on the table to suggest that the Department is not addressing the issues raised in dealing with ISCOR" The official further argued that "ISCOR has bought out 98,8% of the total affected area that may have been influenced by its activities… ISCOR appointed two registered evaluators who independently valuated each property to determine a fair market value. To this value, a substantial amount was added to compensate the seller's removal costs and inconvenience" (DWAF, 2004, Sept 21, Draft reply for minister to De Kock's letter).

What is missing from this logic is that if pollution had been the cause for the buy-out, then compensation for impacts on the community should have been included – but that was precisely the point on which the department had failed, and which kept the activism

alive. So the minister's letter told De Kock: "In my view there is no need to seek other avenues as the situation is being addressed and can probably be solved without outside intervention at this stage" (DWAF, 2004, Sept 21).

In the minister's view, mechanisms for solving any pollution problems were already available in ongoing meetings between ISCOR, DWAF and members of the community. In Mr De Kock's view, this was not the case. In 2005, Johan de Kock took his case to the constitutional court, but did not succeed in obtaining adequate legal presentation.

Conclusion: the state as arbiter and regulator

The aim of this chapter was to describe how the state used its discursive power. The state, in the form of the Department of Water Affairs and Forestry (DWAF) played two roles, one as regulator, and the other as arbiter in this struggle. In the regulator role it made some improvements, along the lines of ecological modernisation, but on the basis of a weak regulatory past and within the inherent limitations of regulation (Szasz, 1994). As the regulator, DWAF granted exemption permits and reacted to accidents like spills. In this role DWAF eventually succeeded in imposing stricter standards for effluents (for example in the 1998 and 2003 water use licenses) and in requiring the installation of new equipment, for example the water treatment plant completed in 2005. DWAF could claim a huge improvement from the pre-1994 situation, and did. However, ISCOR and later Mittal continued to exceed limits and cause spills and the Green Scorpions (environmental enforcement agents from DEAT) in 2007 found several Mittal plants to be non-compliant, publicly questioned their ISO accreditation and closed down the Mittal Vereeniging Steel Works waste site. This behaviour – and these achievements – effectively framed the Steel Valley issue as one of regulation of future pollution in a technical process between the regulator and the state, with the ritual of public participation. Moreover, the regulation was framed within the Master Plan developed by ISCOR. The externalisation of pollution costs onto the Steel Valley community in the past was officially ignored.

The second role of the state, related to the first but going far beyond it, was exactly to intervene in the unequal contest between ISCOR and GSV residents. On this bigger and more fundamental terrain, the state failed profoundly. DWAF appeared to rescue a stakeholder process from the dominance of ISCOR, when it established a DWAF run forum. But when ISCOR rejected the conclusions reached by the forum in late 1998, DWAF appeared powerless to stop ISCOR's unilateral buy-out action, or to – as a minimum – ensure fairness in the buy-out. DWAF became complicit not only in the buy-out, but also allowed ISCOR to escape liability for its pollution, by not "naming the polluter" – as the forum had demanded. This made it immensely difficult for residents to pursue compensation for loss of health, livelihood and community. DWAF essentially delivered the Greater Steel Valley residents to the scant mercies of ISCOR. In so doing, DWAF underwrote a power constellation in the new pollution dispositive, in which ISCOR's overwhelming power in defining, dealing with and communicating the extent and responsibilities for the pollution was acknowledged.

DWAF, when challenged by the polluted community and the media, overstated the improvements in regulation and also used these to obscure their more fundamental failure as arbiter in this struggle. DWAF allowed ISCOR to appropriate and distort the outcomes of the DWAF forum. It colluded in keeping pollution information secret (in the Master Plan) and in so doing, never assigned blame to the polluter – which allowed ISCOR to escape liability, thereby fatally undermining the Steel Valley litigators' chances to achieve compensation. It did not play its role as protector of people's environments in Steel Valley. However, by claiming that it was taking care of the situation, it provided a discursive shield to ISCOR. ISCOR could overpower the (weak and accommodating) regulatory agency of the state, by using superior knowledge of its own pollution, and by appealing to the central role of the steel manufacturer in the South African growth strategy (embedded in growth discourse), which also made for a political outcome that privileged ISCOR. ISCOR was allowed by the state to escape liability.

While in some respects DWAF regulation improved, when confronted by powerful challenges it continued its historically weak regulatory practice. DWAF entered the post-

apartheid era as a weak regulator; in air quality, waste and water. Although regulation existed on paper, enforcement was very weak. In the post-apartheid period, the DWAF, as regulator, allowed a situation of "negotiated non-compliance" to continue, even as it tightened the standards for compliance through water use licenses in this period, which also saw the improvement of environmental legislation. The weakness of regulation is not only historical, but also consonant with an ideological choice, which is both inherited from apartheid (and earlier eras), as well as renewed in the new South Africa. The post-apartheid government continued to grow an essentially unchanged apartheid economic structure, dominated by the Minerals Energy Complex, within a neoliberal framework. The emphasis was on growth, including making the "new" South Africa an attractive destination for foreign direct investment. The results were a continuation of the apartheid and pre-apartheid approach to the economy which allowed the imposition of externalities.

The government played its role as a regulator with a sense of constraint, most obvious in the calculation of officials in the department. Their actions reflect a cautious reluctance on the part of the state or regulator to use its full resources, both from within as well as from outside, possibly reflecting a justified fear of being tactically outflanked, for example through ISCOR's superior legal resources. This is coupled with a reluctance to act against ISCOR, for example by shutting down the ISCOR works as an ultimate deterrent. This reluctance points to the state's tax-dependence as a crucial but hidden logic. Together, these considerations add up to a dispositive – a complex, heterogeneous system of discursive and non-discursive means, with material effects, resulting in a legitimation of the pollution. The pollution dispositive and the roles of all the actors in it, will be dealt with in chapter 10. For now, attention moves to the role and strategies of the polluter.

Chapter 8: The Polluter: Limiting Liability

> "As a psychopathic creature, the corporation can neither recognize nor act upon moral reasons to refrain from hurting others."
>
> Joel Bakan, The Corporation, 2004

Introduction: ISCOR as a strong discursive actor

This chapter argues that the core objective of ISCOR's discursive strategies was to escape liability for the pollution externalities that it had imposed on Steel Valley, and to ensure, in the face of the challenge from the new SA, a continuation of its historical privilege to pollute under apartheid.

The previous chapter has shown how the regulator changed its practices in the new South Africa through legislation, extending participation to the public (but with little decision making impact), intensified its regulation to encourage ecological modernization and legitimized the pollution to the broader public. This chapter tracks the strategies that ISCOR adopted in the face of challenges from the communities in Steel Valley, and how its strategies fitted in with those of the regulator. It also attempts to understand ISCOR's reactions in the light of its history, organizational culture and the often extreme changes it went through as it changed from a comfortable and confident parastatal under apartheid, to a threatened steelmaker suddenly absorbed into the global networks of a ruthless international capitalist competition.

Historically, ISCOR had been used to excluding all critics from decision making about its pollution. It was able to do this from three strong bases. The first was as a giant in the local economy which exercised an overwhelming influence on the local municipality

which it had created and owned, and now kept viable economically. The second was as a key strategic point in the 1980s, part of the military industrial complex of the apartheid laager, with its own ISCOR military commando. The third was as a parastatal providing more than 90% of a crucial input, steel, into the industrial economy, and that took on the general form of production in its environment characteristic of the Minerals Energy Complex: first in its colonial, then its segregationist and later its apartheid form: with migrant labour, and racist and dehumanizing labour practices (Clark, 1994; see also chapter 4). The ISCOR history is described in more detail below, tracing the elements that would have predisposed it towards an overpowering and coercive discursive strategy to continue its pollution and continue legitimizing it, in other words, escaping its consequences.

The pollution issue, though fundamental for Steel Valley residents and activists, was competing for ISCOR's attention with a host of other issues at the time. ISCOR confronted a radically new situation in the post-apartheid South Africa, shortly after ISCOR itself had been privatised in 1989. The new government, since 1994, was suspicious of the inherited Afrikaner leadership of the parastatal and was replacing it with a new one (Rustomjee, interview, 2006 May 23). New legislation for labour and water use was being put into place (RSA 1996; RSA 1998) and in the period 2001-2004 ISCOR was absorbed into the world's largest steelmaker, ArcelorMittal, in a dramatic process of globalisation. It was also challenged by a new constitution and a new political dispensation. Citizens gained the right to access information, and to reach for state power.

This allowed the Steel Valley residents for the first time to organise themselves through local government and as citizens' groups, in order to challenge Eskom. Those affected by its pollution, the Steel Valley residents, made extensive efforts to take part in the decision making, as detailed in chapter 6. ISCOR thus had to learn new tactics to re-establish the exclusion of citizens from decision making about pollution.

This chapter first explores the history that shaped ISCOR's approach to its polluted neighbours. It shows how the principle of limited liability had become a practice for

ISCOR, as it is more broadly for industry and mining in SA. The chapter covers ISCOR in the final years of apartheid, to its privatisation in 1989. It then engages with ISCOR's strategy to escape liability in discursive battles about the pollution, as well as the sources of its discursive power. Events covered in the two previous chapters reappear here, but this time in order to show how ISCOR managed to maintain its dominant position and shape a pollution dispositive, which in turn works on the two main principles that (1) ISCOR's pollution is legitimate – if modulated by ecological modernisation - and that (2) the polluter is more powerful than the regulator.

Evidence from the case study is presented and analysed for polluter discursive strategies and use of discursive resources. This includes ISCOR's response to the early challenges by DWAF, ISCOR's participation in the various forums, the buy-out, the Master Plan and control of the information in it, ISCOR's legalistic approach and various court cases, a "centralisation of information" incident, Mittal's R1 billion "green budget", and the opening of the new water treatment plant. A crucial part of ISCOR's strategy - its capture of the regulator - was dealt with in the previous chapter.

The chapter comes to conclusions about the discursive strategy and tactics of ISCOR, noting strong elements of dissimulation, but also control over the circulation of information (knowledge), and therefore exclusion from decision making. This exclusion facilitated first the externalization of pollution costs (through the imposition of pollution without compensation), and then enclosure of resources: a mechanism for a massive transfer of wealth from neighbours and future generations. ISCOR, or now Mittal, remained the central mover and shaper of the pollution dispositive as it responded to a changing environment and challenges demanding environmental and social responsibility in a new tactical space.

Understanding ISCOR

ISCOR's early years: looking after itself in a hostile environment

ISCOR had specific experiences that shaped its institutional memory and organisational culture. In 1927, ISCOR was established and a first steel works built in Pretoria in 1928. In the years immediately preceding its birth, ISCOR experienced the heat of intense public debate and criticism. Initially, there was heated debate about whether the state or private enterprise should establish the steel industry. ISCOR had actually not been designed to be a pure parastatal. But, at its founding, very few private investors took up the offer of ISCOR shares, and contrary to the plan, it became a virtually wholly owned state enterprise (Prinsloo, 1994).This was only resolved after an international steel cartel which had formed in 1926, threatened both the mines and the railways since their traditional suppliers – the British and the German steel makers – had joined the cartel. Prinsloo argues that this debate discouraged the public from buying ISCOR shares. This public attention included jealous monitoring by big private sector firms. It seems reasonable to conclude that ISCOR's institutional culture responded to the glare of public criticism by growing a thick skin and realising that, in practice, it was immune to public opinion.

Despite its close relationship with and protection from the state, ISCOR's history shows that it could follow an independent route against government wishes. Some of its business strategies were controversial, showing that ISCOR's leadership felt both strong enough and at times possibly desperate enough to develop strategies independent of the state. For example, a second international cartel was formed by continental steel producers around 1934. This time, the SA government refused to protect local steel production, and Van der Bijl reached an agreement with the cartel. Beginning in 1933, the gold mining industry experienced an expansion, which led to a huge growth in the demand for steel in South Africa - from 450 000 tons per year in to 880 000 tons in 1936. This suited ISCOR and the European cartel, but led to an increase rather than a lowering of the price of steel. In 1939 the gold producers complained about the high prices, but nothing came of their complaints. (Clark, 1994). ISCOR was thus asserting its independence from its powerful customers, acting more like a member of an international steel cartel than a loyal local parastatal

Another example of ISCOR's relative independence from the state pre-apartheid was its labour policies. Van der Bijl needed capital for his strategy of subsidiary expansion, and the only place he felt he could save on was on wages for labour (Clark, 1994). White workers did not have the comfortable deal (white workers in industry were better off than those in the mines) at ISCOR that they had expected. ISCOR fell under the Mines and Works Act, and therefore white workers "had little more protection at ISCOR than they had in the country's gold mines" (Clark, 1994: 96).

ISCOR's path through history was not an easy one. In crucial phases its management was disappointed by the reluctance of the state to fund it adequately, or even to protect it from international pressure. ISCOR's management learnt to look after ISCOR's own interests, sometimes in subtle defiance of its owner, the state, and in sometimes competitive, sometimes exploitative, sometimes accommodating relationships to big private capital. In these confrontations and interactions, ISCOR became very much like the big corporations, and became an independent role player. ISCOR, under Van der Bijl's leadership, went into alliance with big capital in the form of Anglo American, which in 1945 took over the coal and other interests of Marks and Lewis in Vereeniging. (Innes, 1984). Anglo American became ISCOR's main partner in business both upstream (mining ore and coal) and downstream (using steel as inputs into other processes). For Van der Bijl this related to placing ISCOR in a better position in the production stream. In this process, ISCOR had, even before the Vanderbijlpark Steel Works were built, become a force unto itself because of its central position in manufacturing. If it was able to defy both its original intended beneficiaries – the gold mines – and its political masters' policies on labour, how seriously would it take its smallholder neighbours complaining of pollution?

ISCOR under pressure, 1989-2000

The history of ISCOR until its privatization in 1989 was covered in chapter 4. Here, the events are discussed that led to the globalization of ISCOR from its status as a privatized

entity. These were turbulent times during the transition to democracy. These were also the times when ISCOR was challenged by Steel Valley residents about its pollution.

South Africa has remained a low cost base for steel production as all its inputs excluding scrap metal are cheap: power (from electricity and coal) is very cheap, labour costs are less than half the world average, iron ore is of high quality and to be had cheaply through long term deals that shield it from fluctuations in the ore price. But that was not enough to keep ISCOR afloat. Between 1992 and 1996, a struggling ISCOR received R875 million from the public purse in the form of a general incentive scheme to keep it out of the red, while it was also a major beneficiary of the accelerated depreciation scheme. These were subsidies to an already privatised steel maker, since ISCOR had been privatised in 1989, with a total of R3 billion in shares (Hallowes and Munnik, 2006). By June 1996, the biggest shareholders were Standard Bank Nominees (26%) the IDC (15%) and Mutual Life (10%). ISCOR was also protected by a 30% import tariff (Roberts, 2004).

Up to 1994 ISCOR continued its pre-privatisation pattern of "producing a wide variety of grades and types of steel to satisfy the range of local requirements. Steel was supplied on a cost-plus basis to the local market, with formula duties to set prices of imported steel above these local prices" (Roberts, undated, 5). This did not work very well. More than 60% of deliveries were not on time, and 15% were rejected because of bad quality (Roberts, undated).

In 1995 a deal was set up to give MacSteel exclusive rights to ISCOR's exported steel, making it possible to segment local and international sales and move to import parity pricing for the domestic market. Also in 1995, ISCOR and the IDC were 50/50 shareholders in the new Saldanha Steel project on the West Coast of South Africa, which was planned as a "lean mill" with cutting edge technology aimed at the export market. In 1998, Saldanha Steel started selling steel. The timing was bad. In that year, large steel surpluses came onto the market as the result of the Asian IMF crisis and the collapse of the Russian economy. Things did not improve as new capacity in China, South Korea and

Brazil led to large price reductions in 2000. Domestic demand was not forthcoming either, at around 4 000 tons, down from the nearly 5 000 tonnes of the early 1980s (Rustomjee interview, 2006).

In 1996, government reduced tariff protection to 5%. The export subsidy was removed. Rationalisation involved the shut-down of approximately 2.5 million tonnes of capacity, and halving the number of grades produced and the slashing of thousands of jobs. By the end of 2000, more than 24 000 jobs had been cut. The Pretoria Works, where demand for railway bars had fallen drastically, was closed completely. The Newcastle Works was nearly closed (BDFM, 2001, March 2). By 2000, Saldanha Steel was bleeding the IDC of cash, accounting for 65% of its portfolio and threatening its very existence. The Saldanha debt was R6,5 billion, "the result of high interest rates, cost overruns and technical problems… (as well as)… the decline in world steel prices" (BDFM, 2001, 1). It was time to find an international investor to rescue ISCOR. (The history of ISCOR's internationalisation is pursued further in chapter 9).

It is easy to understand that ISCOR would have been bruised and battered by the experiences of these two decades, under difficult conditions may have neglected areas that were not core to its survival, and without the mind-space to respond to the longstanding complaints of its neighbours in Steel Valley in a sympathetic and compassionate manner. It was exactly in this time where the very future of ISCOR was at stake, that the ISCOR Pollution Forum was formed, and ISCOR refused to accept the Mooi Water plans and consider any compensation to its pollution victims.

ISCOR's commitment to environmental issues

ISCOR's commitment to environmental issues is a controversial topic. In his detailed 1943- 1993 history of the Vanderbijlpark Steel Works, extensively quoted in this chapter, local historian Professor Prinsloo (1994: 52-53; 117-118) reports on ISCOR's environmental management, as follows. By 1993, ISCOR had spent more than R200

million on environmental management. Solid waste was being managed at a cost of R40 million per year. In 1968, ISCOR was able to halve its water input per ton of steel via internal re-use of water (1994: 52). It also installed a number of water treatment and drainage systems. Chemically polluted water was being treated separately. Other water savings were accomplished via dry cooling of ovens. All processes listed under the Air Pollution Prevention Act (APPA) had been fitted with pollution control equipment. Workers' health was protected by keeping dust to less than the legislated maximum of 1 milligram per cubic metre. The steel works had undertaken a programme of tree planting, and an area of 200 ha on the Northern side has been designated a bird reserve, with more than 104 bird species (Prinsloo, 1994).

Prinsloo's statement that "the prevention of water and air pollution was important to ISCOR" (1994: 53) is in stark contrast to a later "insider" perspective from an employee who worked in ISCOR's environmental management unit, but turned whistle blower and joined the side of ISCOR's accusers in Steel Valley. It also ignores the archive of pollution complaints, the regulators' records, and the various consultants' reports, covered in chapter 5.

A whistle-blower's perspective

Toxicologist Dr Pieter van Eeden readily admits that he did not fit in well with ISCOR culture in his short stint of 19 months (from April 2000 to October 2001) with ISCOR. While he was earnestly trying to ensure that the effluents from the steel mill did not injure people or harm the environment his employers simply "wanted somebody to fill in the permit applications and reports that had to go to DWAF". This is perhaps best illustrated in a heated exchange in this time, when an ISCOR colleague told him "we produce steel" and Van Eeden responded "you also produce dead people" (Interview, Kempton Park, 2005, May 18).

In 2001, Van Eeden blew the whistle on unsound environmental practices inside the company. His departure, in October that year, was sped up by his unhappiness over the testing methods of ISCOR and pressure from ISCOR after he blew the whistle on their environmental practices and made public some pollution reports. He is still very active as a consulting toxicologist and serves as volunteer chairperson of the Klip River Catchment Forum (the Klip River runs from Johannesburg south to the Vaal).

According Dr van Eeden, ISCOR was "cynical, arrogant "and "not serious about environmental issues". Although there was an environmental management system, its focus was limited to complying with existing, weakly enforced environmental legislation. It had no interest in finding the real effect of its operations on the environment. Van Eeden explains:

> `"Up till that time, ISCOR had done only piecemeal pollution control. Doing a bit here and there was also normal environmental practice, up until end of the 1980s, there was no pollution legislation. The 1956 law had very little pollution legislation. Up to NEMA, there was no pressure on any company to do environmental monitoring, except effluent monitoring and what there was, was just chemically based. This was everywhere, why would you do toxicity monitoring if you didn't have to? It cost money. That was what the legislative picture looked like. They had a disregard for the environment and their neighbours" (Interview, Kempton Park, 2005, May 18).

Van Eeden argued within ISCOR that they should test the overall toxicity of their effluent and its effect on water systems around them. It is the combination of substances that makes the water dangerous. But the law only required ISCOR to test the levels of individual chemicals. "This system was very weak", says Van Eeden,

> "Industries, all industry, not only ISCOR, knew when DWAF inspections would happen. And even if caught exceeding such chemical limits, industries would give an explanation, saying 'this or that pump was broken' without any consequences."

Eventually Van Eeden did persuade his boss, Patrick van den Bon, to carry out toxicity tests.

> "My argument was that the new Water Act would require that. The tests showed that the cocktail of different chemicals was toxic. From a purely chemical perspective, ISCOR's effluent was more or less acceptable. But from a toxicological viewpoint, it was not. Not that ISCOR management now thought that their effluent was a danger to their neighbours, or that they were the cause of their neighbours' illnesses. Why would they worry about people complaining about cancer when, as they saw it, those same people smoked like hell and had unhealthy lifestyles?"

At first, Van Eeden had high expectations of a "Master Plan" that was being developed, and of a fellow toxicologist, Ockie Fourie, who was involved in developing the plan and who, as a fellow toxicologist, could be expected to understand and share Van Eeden's concerns. Van Eeden knows the Master Plan:

> "It was a very comprehensive plan, I thought a good plan. It proposed to do many things. Its main aim was to clean up production processes, to minimize existing pollution and prevent new pollution, and start with remediation processes. For example, doing away with dam 10 (an especially problematic unlined dam leaking contaminated effluent), rehabilitating the old slag dump, according to modern processes, building a new slag dump according to minimum requirements, putting in new electrostatic precipitators for the coke ovens. In general, it aspired to cleaner production principles. ISCOR did a complete overhaul of all the information. They drilled boreholes, closed non-functional boreholes, completely reviewed the groundwater situation, did modelling, used new techniques to find groundwater pollution plumes. They found ways to upgrade the terminal effluent treatment plant, the one that goes into the canal, looked at ways how to upgrade all alternatives for the chemical treatment plant. They also did a proper baseline of existing pollution and current pollution."

However, the Master Plan team was not interested in Van Eeden's toxicology findings.

> "As I got to know the team better and could see the bigger picture, I worked out that they were there to give ISCOR what ISCOR wanted. They did not say there were no problems, but that there were no big problems. ISCOR liked hearing that."

Van Eeden concludes: "ISCOR is not serious about pollution, and does not use the data at its disposal to stop pollution." Van Eeden was upset at the arrogance and irritation which ISCOR management displayed towards its neighbours in Steel Valley. He observed that ISCOR was cynical and contemptuous during the confrontation with the Steel Valley residents

> "That's the culture of the white males, with their Broederbond connections. These are consultants who tell ISCOR what they want to hear. And inside ISCOR… people tend to work for ISCOR for their whole lives, and you step into a culture of how people do things… "(Interview, Kempton Park, 2005, May 18).

Part of this culture was contempt for the residents of Steel Valley. Van Eeden says: "Eventually I started visiting the plot owners (in Steel Valley) myself. They told me that they were being treated as second class citizens, as *maplotters* (derogatory Afrikaans slang for smallholders), that they were not respected as human beings at all. ISCOR dismiss them, often saying: "*ag ja*, (oh well) another complaint from these *maplotters*" (Interview, Kempton Park, 2005, May 18).

ISCOR's role in the Steel Valley pollution struggle

The core objective of ISCOR's discursive strategies was to escape liability for the pollution externalities that it had imposed on Steel Valley, and to ensure, in the face of the challenge from the new SA, a continuation of its historical privilege to pollute under apartheid. The next section traces this development from before 1994, to the conscious strategies ISCOR developed in the face of the challenges from its neighbours and, to a lesser extent, the new government.

Before 1994

In the period before 1994, ISCOR was little concerned with hiding the evidence that the pollution existed. The pollution was discussed, as the evidence from the 1960s presented in chapter 5 shows, openly with the regulator, which was also part of the apartheid state. ISCOR was a parastatal up to its privatization in 1989. In this period, a sizeable number of consultants reported on increasing pollution problems, in very specific terms (High Court of South Africa, Case no 00420/01, 2001). This history was treated in chapter 5. During this time there were grumblings from the neighbours, and a local awareness of pollution, through their political representatives, and presumably also in the workplace as a high percentage of Steel Valley residents worked in the steel plant. But these came to naught.

On the other hand, the existence of the servitude, a right recorded on title deeds, from the 1950s, of Steel Valley residents living next to the canal to use the ISCOR wastewater, and the absence of any warning signs against pollution in the canal water, at least implied to these residents that there was no threat from pollution (see chapter 6).

The existence of the pollution was not disputed because in the situation of surplus power, there was no credible threat that any knowledge of pollution could be used to restrain ISCOR's pollution. One attempt when white residents attempted to work through apartheid political structures, via their local member of parliament, George Bartlett, for the ruling National Party, came to naught. Another attempt did have an effect, and foreshadowed later developments. The Tromp challenge (in 1984) was settled with agreements for Tromp and his co-complainants (they complained directly to ISCOR about pollution) to receive water through a specially built pipeline from ISCOR, on condition that they signed confidentiality agreements with ISCOR not to talk about the pollution. These agreements show the overwhelming power of ISCOR in the situation, and also a strategy to limit knowledge of the pollution, and the possibility of mobilising against it, or at least, of active knowledge of the pollution spreading among the Steel Valley residents.

However, with the new democratic government and the new constitution, containing a right to a healthy environment, the situation changed.

The weapon of scientific uncertainty

A crucial aspect of ISCOR's response to the new situation was to deny the existence of the pollution through creating scientific uncertainty about it, and thus paralysing attempts by fenceline communities, activists and the state to hold it accountable for its pollution.

Scientific uncertainty has been a powerful discursive weapon in the hands of polluters, who use it to demobilize pollution victims who defend themselves. It allows polluters to escape liability. The uncertainty of knowledge has been exploited by corporations to delay legislative action. Petroleum companies fought for years to delay action on climate change (Leggett, 1999). Similar strategies were followed to block action against the use of lead in the paint industry (Markovitz and Rosen, 2004). The tobacco industry was the source of an infamous memo that proclaimed "doubt is our product", in other words, a strategy to produce doubt about the hazards of tobacco (Michaels, 2008). These accounts show not only that experts find it easier to be inconclusive in their findings in disputes about pollution, but also include examples of industry interests putting active pressure on experts, through physical intimidation as well as career threats to toe the line and not rock the boat. This industrial resistance works: while Sweden and Japan restricted the use of lead in gasoline in the 1970s, this happened in the US only by 1994 (Markovitz and Rosen, 2004). In South Africa, lead was phased out of petrol only in 2006

The early "archive" of ISCOR's pollution history reviewed in chapter 5 does not display a sense of uncertainty, presumably because of the "safe" relationship between the state as regulator and another component of the state, the parastatal ISCOR. Certainty is also the tone in the 1997 Nolte Report. The report had found, in its "summary of investigations into organic groundwater pollution at ISCOR Vanderbijlpark Works April 1996 to July

1997" that "typical coal tar components such as naphthalene, methyl naphthalene, toluene, pyrene, fluorine, fluoranthene, phenanthrene, ethyl benzene, trimethyl benzene, and benzaldehyde" were present in samples from boreholes in Steel Valley and Linkholm. Nolte explained clearly:

> "These elements are typical of DNAPL pollution associated with coke-oven by-products. Active coke ovens, evaporation dams containing organic pollutants, unlined tar pits, a slag dump containing hydrocarbon wastes and sludge dams are located up gradient of the smallholdings" (Nolte,

The Nolte Report estimated that the pollution plume extended a minimum of 1 200 m from the ISCOR boundary, but that the plume could have an irregular shape because of the complex geology of the area. The report concluded that:

> "The DNAPL pollution plume apparently spread in a finger-like pattern from the source towards the east…. The DNAPL plume along the western boundary of the Works is present over a confirmed minimum distance of 500 metres. The western most extent of the DNAPL plume is a minimum of 200 metres from the site boundary. The potential source area covers a maximum of 7 square kilometres" (Nolte report, cited in case no 00420/01, Heads of Argument: 49).

This certainty is reflected in the official DWAF documentation in which the background to the Forum is concisely spelled out:

> "The ISCOR Vanderbijlpark site has various potential sources of pollution. Current information indicates that the major source of concern is the slag dump situated on the North-Western side of the property. This dump, in operation since 1956, contains hazardous materials and other organic pollutants. Since 1984 ISCOR has been receiving complaints from some of the adjacent plot owners regarding their boreholes which are polluted as a result of the slag dump that leaches into the groundwater…" (DWAF, 1997, Dec 2, draft background document for minister's meeting of 5 December : 1)

Equally, the minutes of an early forum meeting (WGSC, 1997) make a number of clear statements about the extent of the pollution, after an evaluation by an engineering firm (Wates, Meiring and Barnard) of information provided by ISCOR. It says:

> "Salts move faster than other types of pollution and currently the front of the pollution has a radius of approximately 1.5 km from dam 10. Groundwater usually follows the topography of the area. Organic pollution was found near dam 10, into which ISCOR in the past dumped certain tar products. High nitrate values have been found sporadically throughout the whole area and no definite patterns can be determined."

These documents could have left little doubt in the minds of the attendants. But by the time the Cost Benefit Analysis in the ISCOR Forum was completed (1998), the tone had changed to uncertainty.

In general, the Cost Benefit Analysis also acknowledged the existence of the pollution. The study concluded that "almost the entire study area has polluted groundwater or soil, which without remediation renders the area unsuitable for human habitation" (L and W Environmental, 1998:3). The report referred to three main types of groundwater contamination in the area:

> "Organic and inorganic contamination probably originates from the ISCOR works and bacteriological contamination probably comes from French drains occurring throughout the agricultural holdings. Analyses confirmed that inorganic salts, volatile organic (including naphthalene, benzene complexes and halogenated hydrocarbons) and semi volatile organics are present in the groundwater which is extensively used for domestic and agricultural purposes."

The report acknowledged that the contamination included hydrocarbons "that range from innocuous to toxic in their possible effects on human, animal and ecosystem health" (1998:2). The report also acknowledged that "soil productivity has been negatively affected by salinization, possible organic contamination and through waterlogging" and that the area was characterised by "poor air quality", and a "higher prevalence of upper

and lower respiratory tract illnesses than in other areas" (1998: 2). "Particulate matter (such as dust) has been found to be more than double the international safety levels" in the area. (1998: 26).

However, the study was cautious about drawing cause and effect relations. Writing of the "many indirect causes that could affect the soils and thus the agricultural potential of the area" it is acknowledged that "trace elements likely to have an impact on the environment when they are released from burning coal are arsenic, beryllium, cadmium, copper, fluorine, lead, mercury, nickel, selenium, vanadium and zinc. Boron is the most likely to have short term toxic effect but arsenic, beryllium, cadmium, lead, mercury and nickel should also be viewed as potentially dangerous". (1998: 24). And:

> "Although several organic and inorganic contaminants exist in the water and air, there is no evidence at this stage of widespread exposure of people to high levels of contaminants. Nevertheless the people in the area feel ill and perceive the illness to be caused by contamination from ISCOR. The most common symptoms found in community members are fever, headache, hay fever, occasional coughing and shortness of breath. However, these symptoms may be attributable to causes other than contamination. The strongest link between occurrence of illness and contamination appears in people with health problems living in Steel Valley. It must be noted that epidemiological studies to determine a causal relationship between illness and contaminants have a high monetary cost and take a long time to complete. Even then they may be inconclusive. "(1998: 43).

In chapter 7, it was argued that the CBA was deliberately framed to not identify sources of and responsibility for the pollution. It explicitly excluded identifying the cause of the problems: "The CBA was not designed to assign responsibility for contamination or to identify the source of the contamination." (L&W 1998: 13).

Here it is argued that, despite being a central decision making document the study lost the thread of knowledge and certainty that had been part of pollution descriptions before. In the court case of the 16 applicants, the science was also intensely disputed, and, on a

legal point, all previous reports were dismissed as "hearsay", as ISCOR denied the accuracy of all the reports in the DWA archive.

The Master Plan

The most direct ISCOR strategy of creating scientific uncertainty was simply to keep information about its pollution secret through the Master Plan.

ISCOR/Mittal responded to the opportunities opened up by the regulator's ecological modernisation approach in the form of an Environmental Master Plan. This was a massive work, almost a caricature of thorough "environmental management". Its scope of investigation was overwhelming: 22 specialist investigations also referred to as "disciplines", conducted in 19 Environmental Management Areas in a rumoured total of 8000 pages in several volumes that contain the final reports. Its investigations and recommendations covered the steel works itself, the perimeter and the receiving environment beyond the perimeter. Its over-arching objectives related to "protection of human health and the environment" and its secondary objectives were to "ensure measurable targets against which to assess performance and compliance" (ISCOR, 2003: iv).

The specialist investigations consisted of: toxicology, solid waste, sediments, leachates, soils, air quality, ground water, process water system, geotechnical, geology, environmental monitoring, land capability, terrestrial eco-systems, surface water, aquatic eco-systems, a consultation process, noise, archaeology/cultural, visual aspects, land use and socio-economics (ISCOR, 2003). This broad if not totalizing sweep of investigations lent it authority. It can be argued that the Master Plan superseded, or attempted to supersede, previous investigations and consultants' reports, or at least worked to lessen their authority. It can also be argued that the process of the Master Plan created a situation where all of this information "belonged" to ISCOR, and was effectively put out of reach of its opponents. It stands as an impressive and no doubt expensive display of

ISCOR's superior access to scientific discursive resources, and by implication, some measure of control over scientists producing this report who were all bound by strict confidentiality agreements not to reveal information (compare Schnaiberg, 1980).

The report is couched in the language of the "risk based environmental management approach", and included references to the precautionary principle. The plan and the areas are all called "environmental". The 19 Environmental Management Areas are further aggregated into three zones according to the "source-pathway-receptor approach".

Finally, the report moves to solutions by selecting preferred alternatives "for consideration by the authorities" (ISCOR, 2003: iv). These measures come in two main categories, "Institutional Measures" and "Technical Measures". Technical measures mean remediation. These measures total 206 in the Master Plan. The executive summary gives an example of 26 such measures that would apply to the existing slag heap, such as relocating and rehabilitating the railway line, upgrading surface water drains, topsoiling and grassing, water quality monitoring at specific points etc. These technical measures can be assumed to be the basis of the R939.1 million budget for medium term measures, and the immediate (five year) budget of R506.2 million.

It also proposed a 20 year remediation plan, at a then estimated cost of R1 445,3 million. In the next five years, presumably 2004 – 2009, the Master Plan foresaw the need for expenditure of R506,2 million. These would be made up by a MTP treatment plant, gas oven cleaning, a sinter pilot plant and a full scale sinter plant.

However, "institutional measures" is not the same thing as "remediation". Remediation means rehabilitating ecosystems and natural resources. "Institutional control" or "social control" is well known in the nuclear waste industry, in which the highly pollutant nuclear waste is put under permanent guard with highly restricted access (Kreusch *et al*, 2006). It moves the management and final disposal (or in this case the rehabilitation of the landscape) into the future and makes it the responsibility of future generations. As Kreusch *et al* observe, this approach rests on a fundamental assumption of stable social

structures. In this case, it cannot be assumed that in 20 years' time the owners of the steel mill, if it is still operational, will still shoulder that responsibility. In the meantime, however, it provides a pretext for the inclusion of a "buffer zone", the masking of the pollution and the destruction of a community critical of, and making demands of, the steel mill.

The arguments for these measures are worth examining as they articulate ISCOR's response to the public's pressure against pollution, and the regulator's pressure for ecological modernization. The report explains:

> "Institutional measures were motivated in terms of technical impracticability. Areas impacted on by activities within the CRMF (the consolidated residue management facility which included the existing slag heap, dams 10, 11, 1 to 4, the maturation ponds, the raw materials stockpiles area, the processed materials storage area, the CETP (Central Effluent Treatment Plant), sludge dams, and the redundant blast furnace sludge dams) can generally not be remediated to acceptable risk levels through technical measures, over the short and medium terms. Such measures will for example require flushing of the aquifers with "clean" water and/or stream and will in any event take several decades to improve the situation significantly (ISCOR, 2003: iv)."

It is interesting to consider this extract from the report in terms of the knowledges embedded in it (Jaeger and Maier, 2009). In the first place, the difficulty that the report foresees for remediation, confirms the serious and long-term pollution of the aquifers in Steel Valley. It can be argued that this implicit confirmation also explains why ISCOR persisted in limiting access to the report – even after it had been put in the public domain in the 2003 water use license public participation process. Moreover, the proposed solution of "institutional measures" can be argued to explain ISCOR's strategic interest in enclosing Steel Valley and removing its inhabitants.

Reserving all legal rights

Keeping the existence of the pollution scientifically uncertain was only one component of ISCOR's overall legalistic strategy. When the government, as regulator, challenged ISCOR's pollution practices after 1994, ISCOR did not respond meekly to these challenges. When caught during a planned toxic flush-out, it attempted to deny entry to government officials, in clear defiance of legal requirements even since 1961, but renewed since 1994 (see chapter 7).

In chapter 5 it was reported that ISCOR was given the right, in 1961, to deal directly with the public, including its neighbours, about complaints including pollution complaints. In most cases it provided alternative water supplies, in a tacit but legally denied acknowledgement of its role in causing the problem. Smallholders who received ISCOR water had to sign a legal agreement not to communicate about these agreements, or to make further claims on ISCOR. This preference for a legal approach remained a cornerstone of ISCOR's response to challenges from communities and the regulator. With huge financial resources and therefore access to the best legal representation, ISCOR had a very strong discursive weapon to fight off any challenges.

ISCOR used this approach in engaging with the regulator (although there were also many technical exchanges between regulating officials and ISCOR managers), in responding to communities, during various forum and other public meetings, and especially in the aftermath of the Cost Benefit Analysis. In its unilateral buy-out of Steel Valley (see below), it had not only the benefit of its legal team, but also its property arm, VESCO, in gathering strategic information on the smallholders it wanted to buy out.

ISCOR in the DWAF Forum

Whilst participating in the DWAF Forum, ISCOR took the position that the outcomes of the forum would not be binding, and then did not accept them. They suggested a

commission of enquiry, or a mechanism for binding mediation. Correspondence from ISCOR through its attorneys (Moolman, 1999, Feb 17) point to an ongoing debate between DWAF and ISCOR about the status of the Forum and CBA outcomes. ISCOR took a position that ISCOR would not accept liability through a consultant unless it is a senior, expertly qualified and court appointed consultant, and all individuals and landowners had signed arbitration agreements to accept the outcome of the arbitration. ISCOR then recommended a judicial commission of enquiry, whose terms of reference would include investigating the full background to the environmental problems, expropriation or another mechanism for acquisition, providing mechanisms to allocate responsibility and determine financial liability for remediation, provision of services and/or acquisition of affected properties (Moolman, 1999, Feb 17). Why was ISCOR at this stage prepared to open itself to a commission of enquiry, which would leave it vulnerable to public hearings, and the judicial power of demanding to see confidential documents, as well as fact finding? Would the tactic be that the commission of enquiry would make decisions that bind the residents and take away their rights for civil claims?

Following the expropriation "the rights of ownership in the properties must be vested in ISCOR which would then be in a position to undertake the necessary rehabilitation and remediation over a reasonable time period" and an agreement for rehabilitation with DWAF (Moolman, 1999, Feb 17).

There are various elements of dissimulation in this. First, ISCOR participated in a forum with the expectation that it would not accept the outcomes. What was its reason for participating then? Public relations? Gauging the level of threat posed by its neighbours and victims?

In its letter, its prime reason for wanting to take over Steel Valley legally was presented as the unhindered remediation of Steel Valley (Moolman, 1999, Feb 17). However, the eventual actual remediation solutions for the groundwater pollution spelled out in the Master Plan (according to the internal draft executive summary of the Master Plan) are constituted by "institutional measures". This phrase hid the fact that in many cases, due to

expense or technical difficulty, no remediation is foreseen. ISCOR was moving to achieve control over access to the area, not remediation, but presented remediation as the reason for achieving this control. ISCOR's discursive approach in this case was to frame the solution in a monologic fashion. It is a complete, immutable, non-negotiable solution, not in consultation with the affected residents, but as a deal between ISCOR and DWAF, and using state machinery and legislation.

In the end, ISCOR implemented its own buy-out solution, implemented by itself and according to its own demarcation, despite the ineffectual protestations of DWAF that it disregarded scientific and other principles. The ISCOR Pollution Forum was closed in 2000, and in its place an ISCOR Environmental Task Team established, with its first meeting on 9 May 2002, reporting to the Rietspruit Catchment Forum. Its main function was to involve the public in participatory processes, mainly EIAs and licensing processes emanating from the Master Plan. It skirted the Environmental Justice issues in favour of environmental management of ecological modernization.

Buy-out process

In 1999, ISCOR implemented a unilateral buy-out of the Steel Valley area. At the outset, ISCOR denied that it had undertaken to buy out all the properties, and said such expectations had been unreasonably created. By February 1999, tensions were growing between DWAF and local government. DWAF accused the local government of not doing its duty in commenting on the CBA with other parties, but approaching the minister directly. The *Louisrus Belange Groep* (Louisrus Interest Group) in turn accused ISCOR of being arrogant in its approach. They stated that what the residents were negotiating for was "replacement value" – enough money for their properties to be able to rebuild their lifestyle in a similar place to how it was before the pollution. In reply, ISCOR said negotiation in the buy-out would be based on market prices, and "by market price we mean the fair price that a similar property would realize in a similar area unaffected by pollution. In other words, we will not negotiate a price to replace, for

example a 30 year old four bedroom house with outbuildings in Louisrus for a new four bedroom house with outbuildings in Cape Town or Sandton" (Colin Kapp, 1999, May 28).

In July 1999, the buy-out process was well under way, discussed at a public meeting on 21 April, on the basis of a map reproduced as fig 7.1. The map displayed prominently a "bacteriological contamination" resulting from pit toilets and a raised water table, which was an important trope for ISCOR to displace liability for the pollution.

The buy-out process relied on the CBA study in a number of ways. First, it established the buy-out option as the only viable option, and that a majority of owners were in favour of this option (farmworkers and other non-owners were very apprehensive about the buy-out, according to the CBA). Second, the CBA included a property valuation.

Another newsletter (my copy is undated) provided a timeline for negotiations for buy-out between ISCOR and Great Steel Valley landowners who had been made buy-out offers by ISCOR. Property owners could fetch the ISCOR offers based on a valuation exercise by two registered valuators from a site office in Steel Valley from 22 November (although warning that the office would be closed over the December holiday period). ISCOR's offers were valid until 30 April 2000. Property owners whose properties had been bought would have a three month period, after registration of the property in ISCOR's name, in which to vacate the properties.

In 2000 there was a buy out of 350 smallholdings by ISCOR which involved over R75 million. ISCOR eventually bought out approximately 95% (2470 hectares of land) of the properties in the area adjacent to its steel mill. By 2001 only 15 smallholdings remained.

The DWA commented on the buy-out process in a letter which said the Department "takes cognisance of the progress made thus far with the buy-out process", but pointed out that there is a larger area that has been affected and that needs urgent attention. The letter (DWAF, 2000 Sept 14) is remarkably calm and non-directive in the circumstances

where ISCOR is already implementing its (own) un-agreed process to which both residents and DWAF and other stakeholders like WGSC – by then restructured into Emfuleni, Lekoa Vaal etc. - were objecting strenuously. While DWAF observed that ISCOR had already started the buyout, they disagreed with ISCOR's use of the water quality criteria of the domestic user, focused on electrical conductivity (indicating the presence of salts, presumably because, in the reasoning of Nolte (1997) the salts would mark the outside boundary of contamination as the salts move the fastest, and would be in front of the DNAPL – hydrocarbon carcinogenic – pollutants. They argued that the criteria for use for growing crops would be more appropriate. It did not seem that ISCOR listened to this.

DWAF made some "recommendations": to include greater parts of the Steel Valley area, and to commence with investigation in Lamontpark. It suggested that the use of geo-hydro-chemical diagrams or isotope fingerprinting techniques should be considered for pollution source characterisation, and asked that the rehabilitation programme for the impacted area should be discussed between ISCOR and the department. It commented: "In general, the use of ISCOR's criteria for the demarcation of the buy-out zone seems to be unfair and unjustifiable because it does not comply with the main objectives of water quality management…In practice, ISCOR's approach means that even if the quality of water in a borehole deteriorates from a conductivity of 40 mS/m to 60 mS/m, based on ISCOR's criteria it is still acceptable" (DWAF, 2000 Sept 14).

Records from this time also contain a letter from DWAF's legal representatives in the process. They complain that ISCOR does not support conclusions reached at public meetings, and has withdrawn its offer to extend the demarcation zone. The reason ISCOR gave for this change of position sounds cynical: "ISCOR views this process as an attempt to extract charitable donations from them on behalf of both land owners and occupiers" (Cambanis, 2000). DWAF's lawyers were also adrift in what had become a confusing mess by now: "It quickly became apparent to your representative that the stake holders in this process are disorganised, divided and appear to have both personal and political agendas which account for the fact that this crisis point has been reached" (Cambanis,

2000). Why should they all agree when all they really have in common is a polluting giant for a neighbour? And why should they be bound to a process that ISCOR did not feel itself bound to? Here DWAF's lawyers get close to blaming the victims for complicating their work by insisting on justice.

Communicating with the community

The DWAF left it to ISCOR to publish a newsletter on the process. It can be argued that DWAF, through this omission, left the field open for one strong player, the polluter, to act in a role of discursive authority which really belonged to DWAF. However, it was a continuance of an earlier arrangement from the 1960s, apartheid times that the steel maker would manage those complaining about its actions. After the forum ISCOR assumed the role of communicating about the process, including the CBA results and the way forward. ISCOR used it to its own advantage to establish certain strategic "truths", an act of framing, as will be argued below.

The newsletter "InfoLink Feb.1999" (Fig 8.1) showed, in blunt form, what ISCOR wanted the CBA to say. First:

> The Cost Benefit Analysis conducted for Linkholm, Steelvalley, Drakeville and portions of Louisrus at the request of the Minister of Water Affairs and Forestry was concluded during November 1998. Many residents are aware of the findings of the study, but for the sake of clarity, the CBA was not designed to assign responsibility for pollution/contamination. One of the study conclusion (sic) is that no single party is responsible for the pollution in the area.

INFOLINK

Feb. 1999

Cost Benefit Analysis (CBA) Findings

The Cost Benefit Analysis conducted for Linkholm, Steelvalley, Drakeville and portions of Louisrus at the request of the Minister of Water Affairs and Forestry was concluded during November 1998. Many residents are aware of the findings of the study, but for the sake of clarity, the CBA was not designed to assign responsibility for pollution /contamination. One of the study's conclusion is that no single party is responsible for the pollution in the area.

The main findings of the CBA include the following:

- Organic, inorganic and bacteriological contamination is present in the ground water in a large area of the community
- The polluted ground water and soil, without remediation, makes the area unsuitable for human habitation

> Bacteriological contamination (e-coli) is generally the result of poor sewage systems and cannot be related to Iscor or any of Iscor's processes. The sewage from the Works does not flow into the canal but into the municipal sewage system.

- Most of the smallholdings are unsuitable for habitation because of e-coli (bacteriological) contamination that affects 95% of the area
- Most of the area is not ideally suitable to sanitation based on drainage. The existing systems will have to be upgraded from time to time.
- The area is not suitable for planting and sowing and stock farming alone is not economical because of the size of the smallholdings
- Infrastructure in the form of water and sewage is not available. The report says that the local authorities do not regard it as a priority to provide such services.
- The area does not have good foundation soils for building. The soils can affect the structural stability of buildings.

Iscor has certain reservations about the nature of the study and content of the CBA reports and in no way agrees with all the findings, but is nevertheless determined to find a solution to the problem rather than criticising the CBA process.

The Interdict Application

An interdict application was served on Iscor, the Department of Water Affairs and Forestry and the Department of Environmental Affairs and Tourism on 11 December 1998. The interdict application has delayed Iscor's response to and proposals arising from the CBA report.

Iscor is of the opinion that the interdict application, regardless of the outcome, will not provide a workable solution to the problems in the area.

Iscor intends to actively defend the interdict application.

Supply of water

Iscor is continuing to supply water free of charge to residents whose boreholes are not bacteriologically contaminated.

Residents with bacteriological pollution in their boreholes are supplied by the Iscor contractor for the account of the Western Gauteng Services Council. The account owed by the Council to Iscor for supplying these services on their behalf, now exceeds R1 million. Residents who would like to receive water should apply to the Western Gauteng Services Council who will forward their request to Iscor.

Forum meeting

The last Forum Meeting was held on Monday, 18 January 1999 and ended in deadlock.

The rumour that Iscor is no longer prepared to participate in the Forum is untrue. Iscor has indicated to the Department of Water Affairs via the chairman of the Forum that it will continue to participate in the Forum discussions in order to find solutions to the problems.

update

Fig 8.1 ISCOR newsletter on cost-benefit analysis and buy-out process.

This does not make sense. If the study was not supposed to assign responsibility, how can it conclude that multiple parties are responsible? Clearly, this is ISCOR speaking, wearing the mantle of the CBA. Another example is a text box focused on the, for ISCOR, strategic issue of "bacteriological contamination":

> Bacteriological contamination (e-coli) is generally the result of poor sewage systems and cannot be related to ISCOR or any of ISCOR's processes. The sewage from the Works does not flow into the canal but into the municipal sewage system.

But it is not clear that this condition was independent of ISCOR's actions. Over nearly fifty years of operation ISCOR used huge quantities of water, most of which were released to the West, on the surface and via groundwater seepage. It is quite possible that ISCOR's activities did raise the water table and so contributed to the "bacteriological contamination" (Bosman, 2009).

Next, the newsletter presents the main findings of the CBA. It is interesting to note that industrial pollution of the area is almost invisible in this description (which encompasses the whole article in the newsletter on this topic):

- "Organic, inorganic and bacteriological contamination is present in the ground water in a large area of the community.
- The polluted ground water and soil, without remediation, makes the area unsuitable for human habitation.
- Most of the smallholdings are unsuitable for habitation because of e-coli (bacteriological) contamination that affects 95% of the area.
- Most of the area is not ideally suitable to sanitation based on drainage. The existing systems will have to be upgraded from time to time.
- The area is not suitable for planting and sowing and stock farming alone is not economical because of the size of the smallholdings.

- Infrastructure in the form of water and sewage is not available. The report says that the local authorities do not regard it as a priority to provide such services.
- The area does not have good foundation soils for building. The soil can affect the structural stability of buildings."

It then assumes an ISCOR voice: "ISCOR has certain reservations about the nature of the study and content of the CBA reports and in no way agrees with all the findings, but is nevertheless determined to find a solution to the problem rather than criticising the CBA process".

The "bacteriological contamination" became an important factor in deciding who ISCOR would supply free water to. According the same newsletter:

> ISCOR is continuing to supply water free of charge to residents whose boreholes are not bacteriologically contaminated. Residents with bacteriological pollution in their boreholes are supplied by the ISCOR contractor for the account of the Western Gauteng Services Council. The account owed to ISCOR for supplying these services on their behalf, now exceeds R1 million. Residents who would like to receive water should apply to the Western Gauteng Services Council who will forward their request to ISCOR (ISCOR, 1999a, Feb)

In narrative terms, victims of the pollution were being blamed for their own pollution – bad sanitation, allowing their own excrement to enter their own drinking water – while ISCOR's pollution was minimized. But it can be argued that this discursive tactic also had material and financial consequences. When ISCOR finally took over and fenced in Steel Valley, they were able to include public space like roads and verges in their enclosure because of this water supply task, quoted above, that ISCOR had undertaken on behalf of the local government.

Johnny Horne court case

The Johnny Horne court case fitted into the legal approach that ISCOR favoured, and played an important role to initiate the buy-out process. It was after rejecting the results of this forum that ISCOR found itself in court, confronted by the Johnny Horne group with demands to stop the pollution and effect remediation of the area.

The roots of this court case can be found in a lawyers' letter (Van Aswegen Willemse Hartman, March 1998), acting on behalf of more than 60 property owners in Greater Steel Valley, concerning a buy-out and payment of damages. It bases its case on "documentation emanating from ISCOR", starting with the 1982 SRK report through to a May 1997 report, whose authors are not specified. However, the actual court challenge comes in 11 December 1998, thus after the November release of the CBA results, and ISCOR's position that they do not accept the outcome. By the time of the actual court case, the number of participating property owners had grown to more than 100.

ISCOR settled out of court, for a reputed R33 million, used to buy out the properties of the litigants. The settlement out of court is consistent with ISCOR's strategy of avoiding liability. By settling out of court, no legal finding was made which could have provided a platform for other, similar claims against ISCOR. The public aspect of the court case was silenced. It is another instance of the corporate dodging strategy which relies heavily on enforcing silence, non-discussion, and the non-use of pollution knowledge.

The court case also influenced the fate for the DWAF forum. According to Neville Felix, "Johnny grabbed all the results of the investigations of the District Council, and used them in his own interest. Advocate Duard Barnard (one of the few environmental legal practitioners in the country) was hijacked by Johnny Horne and his group. Johnny Horne's court case was a serious obstacle for us… When Johnny Horne started his court case, we saw a change in the attitude of ISCOR. They said everything was now *sub*

judice. How can we negotiate with you in the Forum when some of you are taking us to court?" (Felix interview, 2006).

In Felix's view, ISCOR used the court case as an excuse to withdraw from the forum, arguing that they could not in good faith participate in a forum when the information the forum produces is being sued against them in a court case. This assumes that they have a right to release information about their pollution to suit themselves.

It is interesting to note that ISCOR's first response to the pending court case was to inform the applicants that they should post security for costs at R150 000 – an illustration of deterrents in using the legal route. The commission of enquiry solution would also, as DWA officials remarked, be costly (for the state) as well as time consuming (see chapter 7). It would seem that ISCOR was now mounting a strong legal defence which included financial hurdles for its opponents and the regulator, using its financial muscle. The state still preferred not to use administrative means available to them.

Court case of the 16 applicants, 2001

This court case was started in December 2001, by 16 Steel Valley residents who resisted the buy-out process. The group consisted of 12 black and 4 white people, all owners or residents of smallholdings in the areas of Steel Valley and Linkholm. They brought 21 interdicts against ISCOR to stop polluting their environment. They were also preparing for a class action involving compensation for 450 people ranging from loss of livelihood to cancer and leukaemia. The 16 applicants received funding for research and litigation from the Legal Aid Board and the Human Rights Foundation, of around R2 million, according to Tempelhoff and Tempelhoff (2006). They had confidence because of the DWAF archive containing complaints about ISCOR's pollution, letters from ISCOR that seemed to acknowledge this pollution, and reports from consultants hired by ISCOR that clearly acknowledged the pollution problem, as detailed in Chapter 5.

It can be argued that, in defending this court case, ISCOR showed that it had learnt from earlier encounters. It denied that it had ever conceded the truth of the consultants' reports, instead arguing that these were the consultants' own opinions. To counter the media success of the community, it put a gagging order on the 16 applicants – which led to the founding of the Steel Valley Crisis Committee (SVCC). This and subsequent developments are covered in the next chapter, chapter 9. This second court case resulted in sustained media attention. The group was strengthened by the whistle blower, Dr Pieter van Eeden, who had worked in ISCOR's environmental management unit. However, the community was not able to make a convincing case in court, and the court case was abandoned in 2008. This study does not pursue the details of this court case, but it would make an interesting study on its own.

"Centralisation of information", 2003

During the 16 applicants' court case, the Afrikaans daily *Beeld*'s Elize Tempelhoff reported (15 August 2003) that the Master Plan project leader Dr Ockie Fourie had sent around an e-mail instructing ISCOR staff to destroy all copies of evidence that had been gathered for the Master Plan. Only Fourie and the consultants working for him were allowed to have copies of the evidence, and even the laboratory which did the water tests were not allowed to keep the data. The recipients of the e-mail are told to:

> "1) Please take note of the contents 2) delete from computer and 3) acknowledge by E-mail receipt and deletion thereof".

This shows, at a minimum, that ISCOR took measures to keep the Master Plan and all information related to it, a secret.

Opening of the Zero Effluent Discharge Main Treatment Plant, 2006

On 5 April 2006, the promised Zero Effluent Discharge Main Treatment Plant was inaugurated. This plant stands as a symbol of ISCOR's commitment to achieving zero effluent status, symbolically important because it was the effluent which polluted the canal and the Rietkuil. It is also a concrete symbol of ISCOR's willingness to spend money on the environment. During the ceremony Mittal Steel Vanderbijlpark CEO Davinder Chugh referred to Steel Valley for the first time as a buffer zone, no longer as an area that needs to be remediated. There was no mention of remediation. With Chugh's linguistic shift (an example of dissimulation), Steel Valley was also no longer to be seen as the historic home of the Steel Valley residents, but as evidence of the steel factory's precaution NOT to pollute its neighbours!

The ceremonial opening attracted the deputy minister of environment, Mrs Rejoice Mabhudafasi, who approved of ISCOR's approach in her speech. Activists and critical journalists were invited. The brochure (Fig 8.2) could be argued to contain an acknowledgement of their work: "Because of changing legislation, legacy issues, legal action against the Works and increased pressure from state departments during the late nineties, the need was identified to develop an environmental Master Plan." As an explanation of Mittal's motivation for their environmental response, this is in subtle contrast to the introduction of the same pamphlet, which says "Mittal Steel Vanderbijlpark is committed to the creation of a safe and healthy environment and endeavours to conduct its business in an environmentally sound and acceptable manner. It strives throughout to minimize potentially adverse impacts on the environment and enhances those with positive potential… "

The brochure estimates that "over the years" (presumably from 1952 to 2006, that would be 54 years); the plant has spent "more than R1 billion in capex (money of that day) on a number of air pollution abatement and effluent treatment plants to minimize its impact on the environment. The brochure describes this as: "Today about 35 air pollution abatement plants such as gas cleaning plants, wet scrubbers, electrostatic precipitators and bag houses are in operation. Removal efficiencies (excluding coke gas plant gas cleaning and sinter plant off gas systems) are above 99%. Furthermore, about 35 water treatment

plants are in operation for conditioning of feed water (which cleans water before use, thus not pollution abatement), treatment for recycling and treatment before final release. Water recycling rates of about 95% are obtained."

Claiming a further R1 billion environmental spend into the future is a strong statement. The components of the budget are given, but implemented in piecemeal fashion. The figures of this budget differ in later statements. For example, in a letter from then executive director WF Coetzer to DWAF, it is said that "ISCOR remains committed to spend approximately R1,288 billion in the near future on various projects that will have a significant impact on the environment" (ISCOR, 2003 Sept 5).

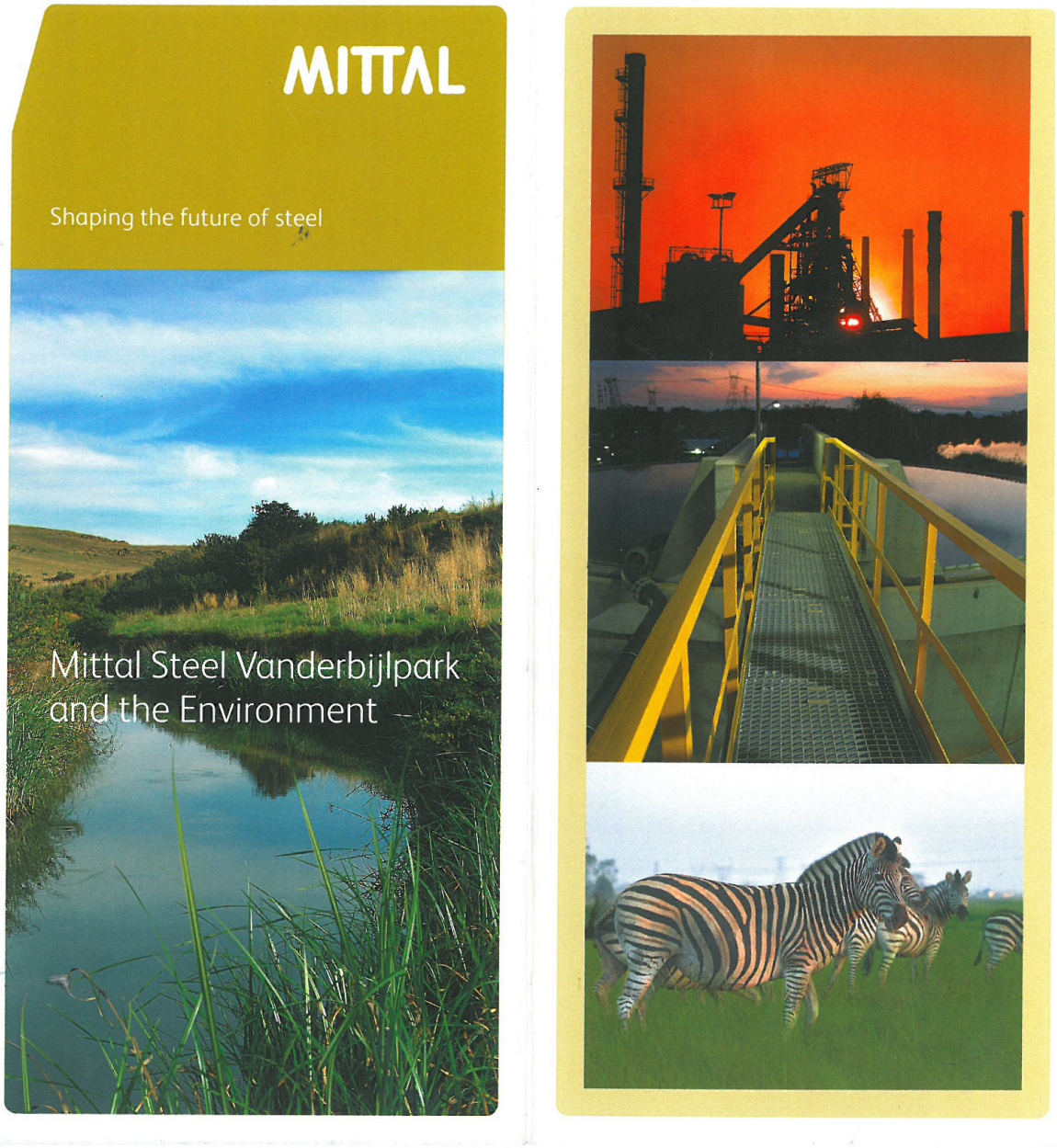

Fig 8.2 Pamphlet for the opening of the Central Treatment Facility (Zero Effluent) works. Publicly distributed pamphlet.

This history shows that ISCOR did respond to pressure from the regulator to upgrade its old technology and reduce its pollution. It also shows that ISCOR was an actor with

strong discursive resources, deployed in single-minded fashion to protect itself – and its shareholders – from becoming liable for compensation or expensive remediation.

ISCOR used the tactic of dissimulation widely. According to Thompson, in dissimulation, "relations of domination may be established and sustained by being concealed, denied or obscured, or by being presented in a way which deflects attention from or glosses over existing relations or processes" (Thompson, 1990: 62). The description of Steel Valley as "a buffer zone" after the buy-out is one example, another is the description of ISCOR's refurbishment budget as "spending on the environment" since it is only partially for environmental improvement, partly it is simply a fact that any new technology will be more environmentally friendly, thus any refurbishment in this sense is environmentally friendly.

Conclusions: strategies to escape liability

ISCOR's discursive space changed dramatically from the safe space it enjoyed as a parastatal before the end of the 1980s. However, ISCOR still succeeded in re-establishing its prerogative to externalize the costs of its pollution onto its neighbours. How?

ISCOR effectively excluded the Steel Valley community from decision making by dominating the debate on pollution. In legal confrontations, it used its overwhelming financial resources to hire legal and scientific expertise. It imposed secrecy and bound scientific expertise to it by requiring confidentiality agreements from all scientists who worked on the Master Plan, and then keeping the Master Plan and other pollution information secret. It excluded its opponents from information necessary to participate in debates on the nature and extent of its pollution. In the end, ISCOR physically destroyed the organised Steel Valley community through what some residents described as a forced relocation in the buy-out process (De Kock, 2000). This excluded a range of actors from accessing the physical evidence of pollution, and enclosed resources in the area – including the reward of all municipal land in Steel Valley (e.g. roads and margins) in

return for the water ISCOR provided to Steel Valley. A current plan under consideration by the Emfuleni district government is to establish a big new landfill "west of Mittal" which could be Steel Valley (interview, 2008, Redelinghuys). This would provide an additional masking of the pollution. The Mooi Waters vision, explored in chapter 6, which would have kept the community intact and presumably allowed for ongoing organisation and monitoring of agreements, came to naught. Choosing this option would have meant reproducing the community, rather than destroying it. Would ISCOR, strategically, have wanted to see a strong, intact victim community?

ISCOR was clearly a very powerful discursive actor. Its financial resources allowed it to buy scientific and legal expertise which could, due to the elite nature of these arenas, overpower the challenges brought against it by citizens. Its power can also be seen in the reluctance of the state to engage ISCOR in what it feared would be prolonged court battles which were by no means assured of a positive outcome, and then a small fine (the result of an inadequate regulatory framework). ISCOR also was a strong actor because of the legal fiction of "limited liability" (Bakan, 2004), which provides employees of a corporation with the legal protection that actions they take in service of the corporation (including polluting neighbours) are not for their personal account, or conscience, but for the profit of the corporation. The broader effects of "limited liability" are explored in the final chapter.

The Master Plan formed a major part of ISCOR's strategy. It used the approach and disciplines of environmental management to agree to the regulator's demand for ecological modernization, aimed at reducing its future pollution. At the same time, it succeeded in framing the conditions for and requirements of this ecological modernisation. It managed to escape liability for its past pollution. This was an intellectual finesse: the Master Plan proved that it had polluted Steel Valley, but because it was difficult to access, that information could not be used in any other arenas. It was, on purpose and with the regulator's consent, constricted to or contained in the arena of regulation… the price of the regulator's strategy of "working with the polluter" was to sacrifice "the polluter pays" principle.

ISCOR's Master Plan strategy illustrates the usefulness of environmental management for polluters. Thus it provides important insights in the role that environmental management can play in the pollution machine. In the case of the Master Plan a great amount of knowledge was gathered – far more than was necessary to fix the problems and explain the causes and responsibilities for the pollution. The Master Plan was a surplus knowledge gathering. It was extremely formalistic and includes chapters on "cultural heritage", "graves", "bird and plant life" etc., maybe not so urgently needed in the examination of a brownfields industrial area, and diverting attention away from the central and urgent question of stopping the pollution and calculating compensation for past pollution.

The Master Plan – and other environmental management interventions – also had the strategic effect of bringing environmental knowledge carriers, professionals who understand the case and its technical dimensions, under the command of ISCOR. These professionals operated under confidentiality agreements in their employment and consultancy contracts. It can be argued that this reduced the likelihood of their knowledge being used as evidence against ISCOR in this struggle, and in some sense, that their professional responsibility for the environment and the people in it, was effectively removed from their control. During research for this thesis, a number of scientists referred to confidentiality agreements as the reason for not being willing to discuss their knowledge of ISCOR Vanderbijlpark pollution.

Two prominent discursive tactics ISCOR employed were dissimulation and controlling the circulation of information about the pollution. In dissimulation, "relations of domination may be established and sustained by being concealed, denied or obscured, or by being presented in a way which deflects attention from or glosses over existing relations or processes" (Thompson, 1990:62). The description of Steel Valley as "a buffer zone" after the buy-out is one example, another is the description of ISCOR's refurbishment budget as "spending on the environment" since it is only partially for environmental improvement. In the realm of circulation, knowledge or information was

simply withdrawn from public access, as in the case of the Master Plan. ISCOR/Mittal also exercised decisive influence over trade unions. For trade unions, management owned the environmental issue and trade unions avoided it, because they believed environmental issue would cost them their jobs (Sikwebu, 2005). And ISCOR had great power within the legal system because of its financial resources.

ISCOR's dominant position in the Steel Valley struggle, and the fact that this dominance was tacitly acknowledge by the regulator, allowed ISCOR to develop a pollution dispositive in which it was the most powerful actor. But ISCOR and Mittal's behaviour provoked resistance from the affected communities, and invited national and international Environmental Justice activists to respond to the situation. This is explored in the next chapter.

Chapter 9: Refusing closure: an Environmental Justice response from fenceline communities

Introduction: On the fenceline of pollution

The argument in this chapter is that in a fenceline community, the risk of pollution impacting on health and livelihoods becomes so obvious and the imposition of pollution externalities so intrusive that the pollution becomes an immediate and overwhelming concern that affects daily life. Fenceline communities are on the fault lines of a risk society: where the risk is not contained and there is no way that any manipulative, legitimating communications strategies can succeed. Fenceline communities are in a position to connect the local pollution to the national and international economies, and the EJ framework enables them to do this.

Where fenceline communities suffer not only the direct consequences of pollution, but also become embroiled in political battles about the consequences, they often face a loss of faith in broader society and their place in it. They go through a legitimacy crisis as experts, government officials and the polluting corporates' officials accompany them through a series of disappointments. The undeserved onslaught raises questions like "Why us? Simply because we are next to the polluter?", "Why don't they care?" and fear: "How polluted are we? What future risks are we facing?" (Levine, 1982).

In this way fenceline communities are placed in a position where their subjective experiences of the injustices and the hollow promises, the lack of legitimacy, the lack of sincerity, the rhetoric that does not hold, add up to an insight in the fenceline community that it is indeed being sacrificed to the national growth ideal "in the national interest", while their own interests clearly do not coincide with a rhetorical national interest (Schnaiberg, 1980).

Living in a "double risk" society makes the experiences worse, and intensifies these insights (Rinkevicius, 2000). There is no cushioning in a poverty situation. Where there is poverty, pollution impacts more severely, creating more intense poverty. During many interactions Vaal Triangle residents who are VEJA members explained that they and their relatives do not qualify for local jobs in heavy industry. They need to do lung tests before they get appointed, which they regularly fail since their lungs are affected by constant pollution (VEJA strategy meeting, 2006, small group discussion).

Pollution imposes very real costs on fenceline communities. As recounted in chapter 5, Scorgie calculated in 2004 that, on an annual basis, as a result of pollution, around 11 600 people in the Vaal would be admitted to hospital with respiratory problems (problems serious enough for hospital admissions), 90 people would be admitted with cardiovascular (heart problems), 25 premature deaths would occur, 24 000 people would suffer from chronic bronchitis and the pollution would result in around 78 750 restricted activity days (9 days per year per economically active person). The direct health costs associated with inhalation exposures to PM10 particulates (particulates small enough to get into the lungs), SO2 and NOx would add up to around R289 million per year. This does include indirect costs or cases that are difficult to identify, e.g. leukaemia from exposure to benzene, which are no less real or expensive (Hallowes and Munnik, 2006; Scorgie, 2004).

For some communities in the Vaal Triangle, the industrial pollution has come to present a continuity from the impositions of apartheid. Its intellectual leaders, such as VEJA's chairperson Phineas Malapela, but also many others in the organization, interpret pollution as merely another aspect of unchanged capitalism in the new South Africa (Malapela, interview 2005). This interpretation accords very closely with the basic framework of EJ thinking. It brings together the elements of environmental racism, the basis of Environmental Justice thinking, with an awareness of class factors. As shown in Magubane's work (2007), which is explored in chapter 10, race and class are historically inextricably related both in South Africa's history and the history of capitalism.

An Environmental Justice approach lends itself to social movement building. Solidarity is very important to the EJ movement. Solidarity consists of social trust, networking and the willingness to share resources including knowledge, as well as the willingness to enter into dialogue which each other, justify and adjust positions in the light of experience, insights and interaction with others. Solidarity unlocks ideological, knowledge, financial and voluntary time resources as well as the courage to act. It is the dialogic glue that holds together networks and alliances, and facilitates strategic flows of information.

Previous chapters describe the role of discursive power in a pollution dispositive at work in Steel Valley as it responded to a challenge from polluted residents. The dispositive can also be read as a description of the tactical terrain for EJ activists and fenceline communities who engage in struggles to regain or establish their rights, or defend themselves against pollution. From a chronological perspective, the response from fenceline communities in the Vaal Triangle in solidarity with the international EJ movement is discussed here as the fourth and final phase of the case study; a period from 2002 to 2009, in which the polluter itself changed from a privatised national parastatal to a subsidiary part of the world's biggest multinational steelmaker.

The first section describes how VEJA, founded in 2004, as a response to this history, reframed the Steel Valley struggle into a refusal to accept the defeat, and to allow closure on these injustices. VEJA systematically built its own capacity with support from the broader Environmental Justice movement, exemplified in the attention the Steel Valley issue received during the World Summit on Sustainable Development in 2002. It then acted in solidarity with other fenceline communities in the Vaal Triangle and more broadly in South Africa. This solidarity became international as VEJA joined in and played a central role in an international alliance of fenceline communities and activists keeping a watch on the activities of ArcelorMittal worldwide. This development is framed in a description of the globalisation of ISCOR into a subsidiary part of ArcelorMittal in the period 2001 to 2004, and then as part of Mittal's global empire.

The chapter also explores how VEJA was nurtured by the global movement for Environmental Justice, and in turn contributed to it. It describes a form of power that is quite different from the dominating discursive power belonging to Mittal and buttressed by the state. While the discursive power of the polluter is monologic and instrumental, VEJA built a power that is collective, reasoned through by sharing experience, questioning and reaching through to the truth of the situation – both in terms of the immediate pollution and in developing frameworks that explain the social causes of the pollution, and alliances across a spectrum of political philosophies but increasingly clear on the social causes of the pollution.

VEJA devoted much energy to building the capacity of its members to understand pollution phenomena scientifically, and to link with established scientific experts to serve its cause, whether nationally or internationally. In this it was crucially supported by its national and international networks.

Steel Valley residents and activists and their allies refused to accept closure on this issue, and instead came back with strategies that used these bitter experiences as a dynamic source of learning and motivation, to build solidarity and reframe their experiences in terms of a broader, indeed global, struggle for Environmental Justice – as promised in the constitution, and going beyond it: as formulated on the experiences and insights of fenceline communities worldwide.

This author has been very closely involved in this formative phase of VEJA, both as activist and participant observer, as explained in chapter 3. I served as adviser on the steering committee for four years from 2005 to 2008. While this brings an in-depth understanding of these developments from an insider perspective, the reader needs to keep in mind the inevitable sympathies that would grow with such an approach and how these sympathies would influence the understanding and presentation of this history. The author encourages other scholars to revisit and critique this history from other perspectives.

Establishing an EJ alliance in the Vaal Triangle

The origin of the Vaal Environmental Justice Alliance (VEJA) can be identified in an event at the end of the first phase, in 2001, when 16 applicants took ISCOR to court. During the course of this legal challenge, Steel Valley residents met regularly to discuss tactics and events in the battle, and engaged with the media. To counter the negative publicity, ISCOR acquired a gagging court order on the 16 applicants in 2002, continuing its legalistic strategy as noted above. On the advice of the 16 applicants' legal team, the children of the applicants formed the Steel Valley Crisis Committee (SVCC) and spoke out on their parents' behalf. The community was supported in its efforts to resist the gag by the Freedom of Expression Institute, (FXI), which planned to challenge the gag in the constitutional court as a violation of the freedom of expression contained in the Bill of Rights. On the eve of the FXI's proposed constitutional court challenge and in the days before the WSSD, ISCOR changed its mind and asked for the press gag to be withdrawn. (Member of the legal team interview, 2003). However, by then the SVCC had been formed already. Mass mobilization included a protest march in July 2001 to ISCOR and the handing over a memorandum of demands**.** Protestors' demands included that ISCOR should stop polluting, provide clean safe water to residents still forced to drink the poisoned borehole water and buy out polluted properties at replacement cost.

In the next year, the World Summit on Sustainable Development (WSSD) took place in Johannesburg, 70 km from Steel Valley. This was the ten year follow-up to the first Earth Summit, where Agenda 21 had been accepted by heads of state. The state meeting was accompanied by a parallel event which brought literally thousands of international environmental activists into the country. By the time they arrived, the SVCC had been integrated into the national Environmental Justice movement, which in turn was hosting a corporate accountability week at the WSSD, where the Steel Valley story was exposed to fellow activists and the media. Steel Valley activists also learnt that their experience was one that was shared by many other fenceline communities including in Burma, Nigeria, Ireland, India and the United States. This added confidence and dignity to their struggle, and nurtured the seeds of solidarity. The organiser and host of the accountability

workshop, the South African NGO groundWork, an affiliate of the Friends of the Earth, continued to play a supportive role in the development of VEJA, which incorporated fenceline communities, particularly in Sasolburg, that had been supported by groundWork before these developments. At the same time, the Johannesburg office of the Heinrich Boell Foundation, which is allied to the German Green Party, had taken an interest in this struggle. The foundation organized a visit of a busload of European parliamentarians, as well as the international and local media.

Fig 9.1 The Vaal Environmental Justice Alliance grew from the Steel Valley Crisis Committee, which used the opportunity of the World Summit on Sustainable Development in 2002 to connect to the global Environmental Justice movement.

Steel Valley residents, black and white, participated in mass protests outside the steel factory gate (Fig. 9.1). In August 2002, the SVCC participated in the groundwork

corporate accountability protest in Johannesburg. Its activists and issues were included in the big WSSD march on 31 August (Munnik and Wilson, 2003). The HBF also organized a similar toxic tour of the equally polluting coalfields in Mpumalanga at the time.

For the tour, the HBF staff had developed an extensive dossier of background information, as well as local contacts and knowledge of the Steel Valley residents. Foundation staff became personally interested in the issue, worked after hours and over weekends, kept up the research, widening it to how the international steel industry works, Mittal's history and modus operandi, the pollution of steel making and international standards for the steel industry. These important discursive resources were used as this momentum of solidarity continued after the WSSD, when a Friends of Steel Valley (FOSV) support group was formed. As noted in chapter 3, this author was part of the Friends of Steel Valley as researcher and facilitator of meetings. Again, I caution the reader against possible bias that may emanate from my positionality.

This group provided capacity building and information analysis for the Steel Valley Crisis Committee. For example, in July 2004, it provided background materials about Steel Valley to the Parliamentary Portfolio Committee in preparation for their official visit to the Free State and Gauteng. They encouraged the committee to provide an opportunity for "a resident of Steel Valley… to tell you their side of the story" (FOSV letter dated July 29, 2004). Dr Stefan Cramer was taken on a flight by the Bateleurs (an NGO that offers flight opportunities for environmental purposes), and produced an extensive collection of photographs, some of which are used in this thesis. One of the photographs was brought to the attention of the Department of Environment and Tourism, as it showed that bags containing hazardous materials were being buried in the slagheap (Fig 9.2). There was no state response from this intervention.

FOSV used its informational resources and extensive international networks, to support the Steel Valley Crisis Committee, including a bursary for the SVCC coordinator, Samson Mokoena. In this case, the global character of solidarity in Environmental Justice

is apparent, but local activists and intellectuals who had independently taken an interest in the case, also participated.

Fig 9.2 Friends of Steel Valley picture presented to Department of Environment Affairs showing dust bags with potentially toxic content being readied for burial in the slagheap. Picture by Stefan Cramer.

The workshops organized by the FOSV attracted participation from other groups in the Vaal Triangle who could also be described as fenceline communities, or neighbours of polluting industries. In December 2004, during a SVCC workshop, these communities decided to unite in a Vaal Triangle wide Vaal Environmental Justice alliance, explicitly based on the principles of Environmental Justice.

VEJA, an alliance of fenceline communities

VEJA's founding workshop, on January 22, 2005, specified a list of 17 aims and objectives for VEJA. (The current author was the facilitator of that workshop.) These aims and objectives contain a mixture of goals, tactics, demands and plans. They focus on a broad range of aspects of the tactical situation, and show that the members of the new VEJA brought a wealth of political knowledge to the new organisation. VEJA formulated its strategic objectives in January 2005 in the following way (VEJA, 2005, Jan 22):

1. "Stop pollution.
2. Get compensation.
3. Ensure participatory and transparent monitoring.
4. Get government to enforce and strengthen existing anti-pollution laws.
5. Get and share information.
6. All relevant government departments must protect us.
7. Put pressure on government through mass mobilization.
8. Educate people about their rights and build capacity.
9. Unite different communities and organizations for the objectives of this alliance.
10. Forge links with organizations/allies beyond the Vaal.
11. Rehabilitation of industrial sites and affected surroundings.
12. Government agenda and health and environmental issues driven by the people.
13. Fight for Environmental Justice.
14. Organize for Environmental Justice in the Vaal Triangle.
15. Organize resources to make objectives possible.
16. Have a platform to question environmental compliance.
17. Have a broad Environmental Justice alliance."

Some of these objectives are impacts that VEJA intended to achieve on its physical and political environment: that is to stop pollution, get compensation, ensure participatory

and transparent monitoring, get government to enforce and strengthen existing anti-pollution laws; to insist on protection from all relevant government departments, and the rehabilitation of industrial sites and affected surroundings; and the demand that the government agenda on pollution, health and environmental issues should be driven by the people. These spell out a political agenda of people-centred, transparent and participatory regulation and law enforcement, strong enforcement of pollution laws and achieving the end of pollution, compensation for pollution costs, as well as rehabilitation – the full application of the polluter pays principle. All of these principles are, in theory and rhetoric, part of the approach of the new South African government, but are not seen to be applied.

Secondly, some aims and objectives specified tactics to be used. There is an emphasis on participating effectively in decision making by focusing on getting information, educating people about their rights, building capacity, ensuring participatory and transparent monitoring, and sharing information. At the same time, the time honoured tactics of putting pressure on government through mass mobilization, protests and demonstrations were set to continue, as indeed they were by VEJA in the ensuing years, attracting both press coverage and strengthening social mobilisation. The tactics are explicitly formulated in terms of Environmental Justice, which framework was clearly adopted and held in mind by adding into the name of the new organisation.

Thirdly, the new organisation was very clear about the need to build a platform from which to achieve its aims, through building VEJA as an organisation and networking for support: educating people about their rights and building capacity, uniting different communities and organizations for the objectives of this alliance, forging links with organizations/allies beyond the Vaal, organizing for Environmental Justice in the Vaal Triangle, and acquiring the resources to make these objectives possible. This would result in creating a platform to question environmental compliance, in the form of a broad Environmental Justice alliance.

Building a strong platform for Environmental Justice

An immediate dimension of VEJA's work was to build a strong platform from which to fight for Environmental Justice. As argued in previous chapters, the building blocks had already been created by the experiences of fenceline communities of ongoing externalisation of pollution costs onto them. The VEJA members all came from communities affected by pollution in the Vaal Triangle. They included representatives from the Rainbow Environmental Youth Organisation, the Sebokeng Environmental Group, the Vaal Working Class Crisis Committee (VWCCC), the Christian Knowledge Independent Churches Federation of South Africa, the African Genesis Heritage Environmental Club, the Sasolburg Air Quality Monitoring Committee and the Boipatong Environmental Committee, the Bophelong branch of the Catholics' Bishop's Conference Justice and Peace branch, and the ex-Samancor Retrenched Workers. Also present was the National Union of Metalworkers of South Africa (NUMSA), and represented on the first Steering Committee. Together it was decided to broaden the struggle against ISCOR to include other corporations in the Vaal Triangle who are concerned with "profit at the expense of environmental and social justice", particularly SASOL's pollution of the air and Samancor's poisoning of some of its workers.

The 15 affiliates that presently constitute VEJA are marked by a diversity, ranging from small faith-based groups to the large, Vaal Working Class Crisis Co-ordinating Committee. All organisations share a sense of injustice about what is going on in the Vaal Triangle. A frequent theme is the difficulty of challenging the power of corporations like Samancor and ISCOR (Mittal Steel). The setting includes the corruption of local municipality which is well known in the area, especially after 30 municipal officials were arrested for corruption in 2005. ISCOR itself has been implicated in corruption.

The SVCC thus became networked into a broader, Vaal Triangle based, alliance of "fenceline communities", that is communities living next to industrial plants and being polluted by them with serious health effects. The leading organisation is groundWork, an offspring of the Environmental Justice Network (which had been formed in 1992 and

helped to develop a philosophy and practice of Environmental Justice in South Africa as detailed earlier.) groundWork did its first work with the communities of South Durban, fighting against the constant air pollution caused by oil refiners, chemical and other industries in this area. It later extended to the chemical complexes of Sasolburg and Secunda. The Sasolburg Air Quality Monitoring Group was a core organisation of the newly formed VEJA. GroundWork, in turn, is the South African counterpart of the Friends of the Earth, an international network with access to knowledge, funding, moral support and ongoing campaigns focusing on corporate accountability. GroundWork hosted a conference on corporate responsibility as a parallel event to the WSSD. A hallmark of this work is fearless and well-informed confrontation of corporate abuse, including the annual Corpse Awards, awarded with much fanfare and humour, to corporate polluters. One of the annual groundWork Reports in which this author participated, entitled *Poisoned Spaces: Manufacturing wealth, producing poverty* (Hallowes and Munnik, 2006), included participatory research in the Vaal Triangle to both learn from local activists, and expose local activists to Environmental Justice research.

VEJA's expressed demands are the end of pollution in the Vaal Triangle, the repair of pollution damage to the environment and compensation for pollution damage to people's health and livelihoods. At a workshop in November 2004, VEJA formulated its objectives as an organisation:

- To promote a culture of environmental awareness and sustainable development; to provide a local network of support and assistance to community- based organizations, non- governmental organizations, trade unions, religious groupings, youth, women's groupings and any other organisations that promote Environmental Justice and sustainable development in the Vaal.
- To promote an understanding of the inter-related nature of social, political, environmental and economic factors limiting or enabling the achievements of a sustainable, equitable and just society, and to promote the wise use and conservation of natural resources.

- To engage with other role players including but not limited to the local authority, provincial and local government, industry and commerce, in order to promote a healthy, safe and sustainable.

VEJA has declared itself prepared to "negotiate and fight for Environmental Justice in the Vaal" (VEJA pamphlet, October 2005). Strategies include an engagement with both the local and the national state, to achieve administrative justice. There is a commitment to using the new political spaces that democratization has opened up. Engagement with different state structures in addition to DWAF, such as DEAT's planned process to implement the new National Environmental Management Air Quality Act in the Vaal Triangle. VEJA has engaged with local government on numerous occasions. It has also undertaken mass action in alliance with broader social movements in the area. Overall, VEJA has been able to reach up into the decision making levels of the local state and down into grassroots communities, as well as to forge linkages with other Environmental Justice groups at national, regional, continental and global levels.

VEJA's work

The VEJA steering committee – of which this author was a member from 2005 to 2008 as discussed in chapter 3 - insisted from the start that the activities of affiliates would be encouraged to continue, and that VEJA would not become a super-organisation taking over their activities and legitimacy. For that reason, the steering committee reflected all the affiliates, as far as possible and individual affiliate focus areas and activities continued. However, during annual strategic meetings, four specific VEJA focus areas and task teams were established. The task teams focused on water quality, air quality, waste and health issues. They were drawn from across the affiliates.

VEJA decided on the following activities: co-ordination, mobilization, awareness and capacity building, building (institutional) structures, fund raising, lobbying and networking. The following strategies were foreseen: mass action, consisting of picketing,

pamphleteering, campaigns, political theatre, negotiations, involvement of national bodies like the Human Rights Commission, participation in processes like the Strategic Environmental Assessment for the Vaal region and Environmental Impact Assessments, workshops, needs assessments, and engagement with ISCOR (VEJA, 2005, Jan 22).

The first work was to develop a detailed vision for Environmental Justice in the Vaal region, and building the organisation strength and capacity to carry this out. Here the new organisation benefited from a similar alliance that had been established in South Durban - The South Durban Community Environmental Alliance (SDCEA), established in 1996 bringing community based organisations and NGOs together (groundWork, 2002). SDCEA was formed to defend communities against the pollution of petrol refineries Sapref, jointly owned by Shell and BP, and Engen, controlled by Petronas, as well as other industries, including a paper mill. SDCEA had to deal with very similar externalisation of pollution onto them. As groundWork reported in 2002:

> "Fires, explosions and leaks have become so common that they can almost be considered a normal operating condition for Durban's industrial plants. Both industry and the authorities have apparently been reluctant to inform the community of potential hazards and, as yet, there is no coherent off-site emergency or evacuation plan to cater for this community of approximately 270 000 despite sustained lobbying by SDCEA. There are no buffer zones and people live on the fence-line of their polluting neighbours" (2002: 37).

Residents complain of high rates of cancer and respiratory illnesses. Health studies showed levels of respiratory illness clearly higher than in areas outside South Durban. A study of primary school students indicated high rates of asthma that corresponded to changes in levels of air pollution (Naidoo et al, 2007). SDCEA had followed a route very similar to what VEJA intended, consisting of community mobilisation, protests, capacity building, negotiation, health studies, solidarity networking and establishing its own institutional capacity. SDCEA offered assistance through presence at various meetings, as well as the use of its constitution, which VEJA adopted with some adaptations.

Despite outside help, VEJA built itself primarily on the basis of the capacity and histories of its affiliates. An interesting example is the Vaal Environmental Working Class Crisis Committee (VWCCC), whose chairperson, Phineas Malapela, also became the VEJA chairperson. Malapela and his organisation illustrates the political and discursive resources that a history of anti-apartheid activism had created in the area (Malapela interview, Vanderbijlpark, 2005 August 2). His account also shows how, in the Vaal Triangle, Environmental Justice concerns grow organically out of the anti-apartheid struggle and current social justice struggles. The social justice struggles also provide a model and experience of solidarity and national and global networking. Malapela, with B Juris degree and a UNISA diploma in Labour law, has been an activist since 1982, when he was a student at the University of Zululand. He participated in the 1984 Vaal uprising, and had been detained several times. Although he now works for a trade union, he has devoted long periods to unpaid activism.

> "Malapela was a founder member of the VWCCC, in 1998. The trigger for starting the organisation was a summons issued by the Council against some 470 former employees of ISCOR who were not paying service charges. They were occupying houses obtained from ISCOR in a loan scheme, houses which cost between R45,000 and R60,000 each. The Council wanted to sell these properties. At the time, Phineas was staying in Zone 17 on ISCOR property. He called a meeting which formed a committee and decided on the name. Initially the organisation focused on local evictions. They had several victories such as overturning the council's plan to evict ISCOR workers from their houses. The VWCCC got the council to change their policy and withdraw their summonses. They also won against Eskom when it started evicting retrenched workers from Eskom houses in 1998. They took Eskom to court with limited resources from international contacts like the Fourth International and Eskom withdrew. "Then we joined the APF (Anti Privatisation Forum) struggle in earnest" (Cock and Munnik, 2006).

The VWCCC also gets involved in labour law, supporting workers' who have health and workplace issues, transport issues, health and township clean-ups, and recycling. According to Malapela:

> "In 2003/4 we started focusing on the question of ISCOR. Many of our supporters were ex-ISCOR workers who had occupational diseases like cancers, ulcers and asthma. Some got compensation after we took them to the Department of Occupational health. We pushed to get access to the records of the medical centre inside ISCOR. At that stage… we didn't work with the SVCC because we didn't know about them" (Cock and Munnik, 2006).

A strong antagonism towards ISCOR was expressed by many VEJA members. There is a suspicion that ISCOR security personnel were involved in the 1992 Boipatong massacre when 50 residents were killed, through supplying arms to IFP supporters (Cock and Munnik, 2006). In 2006, the VWCCC was involved in three cases against ISCOR: "The first is against the security department. ISCOR dismissed the security personnel and outsourced the function. The company collapsed, but ISCOR failed to recall the 670 retrenched workers within 2 years as agreed, so we took them to the labour court. Secondly we exposed corruption within ISCOR… Whites were being rehired by sub-contractors and there was bribery involved. Carstens (general manager of ISCOR) got R50 million in bribes, we exposed him and ISCOR investigated, he was suspended and then dismissed. The third case concerns evictions from an ISCOR hostel in Sebokeng… After retrenchments ISCOR wanted to sell the hostel to the municipality of Vanderbijlpark. Three councillors founded an investment corporation and took over the hostel for R5 million, even though it was worth R19 million. About 6,000 people rented rooms, but did not pay for services. In 2003 the councillors ordered evictions, and called the Red Ants. The community attacked them and unfortunately 4 people lost their lives. They tried to sell the hostel to the council for R15 million. It was agreed to make sectional title divisions and SANCO and the South African Council of Churches formed a forum." (Mapalela interview, 2005)

VEJA's next biggest affiliate is the Christian Knowledge Independent Churches Forum of SA (CKICFSA), which has organised thousands of its members to march against injustices in service delivery. There is a strong sense among CKICFSA members that local government "lacks the capacity to address our grievances." The Samancor Retrenched Workers Coordinating Committee (SRWCC) has been engaged in a

compensation struggle against Samancor, and it seems the outcome is that between 500 and 1000 ex-workers may receive compensation without admission of liability. The Sasolburg Air Quality Monitoring Group (SAQMG) has been monitoring and protesting pollution from SASOL. There are equal numbers of men and women who are active in the affiliate organisations. VEJA is determinedly non-partisan and accommodates different streams of thought. VEJA's deputy chairperson in 2006, Matshediso Tsotetsi, is a local councillor and staunch member of the ANC.

Building capacity to engage

VEJA's first steps consisted of a series of strategic planning meetings to define a common vision and approach, the results of which were presented above. It established an office with a computer, telephone and access to internet and e-mail, a system of supporting meetings through transport money for those who needed it, a constitution, as remarked above, and one full time co-ordinator. The majority of tasks were still carried out by volunteers. The Steering Committee met monthly, and the task teams as needed. It also embarked on a sustained capacity building programme for its task teams – although its capacity was equally built through engagement in several processes, to be considered in the next section. Water quality training has been provided by, amongst others, Dr Pieter van Eeden, the ISCOR whistle blower previously named, who is also active in several catchment management forums. FOSV experts have also contributed to capacity building, and expertise has been accessed through lawyers for human rights in EIA processes, the support of Eugene Cairncross in air quality processes, and through exchange of information internationally. This is similar to other situations, such as Lois Gibbs and her institute, in the Love Canal case and Beverley Paigin, a sympathetic scientists (Levine, 1982). Such support is the result of solidarity and "just cause" and shows that there are scientists who sincerely believe in this as an ethical responsibility.

The task teams defined their methods as education and awareness, advocacy, research and networking. The waste task team familiarised itself with waste management plans at

local government level, learning to distinguish between domestic, industrial and medical waste. It engaged in the Waste Bill which was under discussion from 2006. It became involved in the EIA for the Boitshepi Landfill, joining the landfill committee. It also joined in research for the 2008 groundWork report, which focused on waste. Through this process, it came in contact with a number of reclaimers working on local landfills, and now organised in a national movement with international linkages. This research and collaboration uncovered a number of issues to improve in policy and legislation to support the reclaimers in their efforts to earn their own livelihoods, including health issues and the recycling value chain. The air quality team built on work done with Sasolburg Air Quality Working Group, supported by groundWork. The bucket system (for taking air samples on suspicion of air pollution, which are then sent away for testing) was extended to Boipatong, which is right next to ISCOR (Mittal). This is a strong programme that builds on past collaboration, and is anchored in the work of the SAQWG. The water quality team focused on the Steel Valley water pollution, and the activities of the Rietspruit and Leeutaai subcatchment forums. In 2009 the VEJA co-ordinator took over as chair of the Rietspruit forum. He was instrumental in establishing a tradition of Water Affairs officials working with VEJA and other community activists while taking samples, and VEJA became a point for reporting spills and other water quality threats to the department. This has laid the basis for citizens' monitoring in both water and air quality.

The health task team also decided to start their work with capacity building, which happened with groundWork and international support. The next plan was to do research on the prevalence of pollution-related illness in the area, basing this on contact with clinics. However, this was very difficult to do, and has so far not gotten off the ground. VEJA and the VWCCC continued supporting workers who developed health problems while working for ISCOR, but were then retrenched, to demand their compensation.

VEJA's 2008 strategic assessment meeting showed what the 3 task teams were busy with at the time. The air quality team counted among their achievements their training in bucket sampling, a protest outside Mittal Steel, participation in the air pollution priority

area process, submissions to DEAT, including submissions on the national Air Quality Act framework, participation in the EIA for Lethaba power station, various civil society meetings, participation in research by the University of Cape Town, receiving bucket sampling training and participating in a bucket brigade conference in India. The water team counted among their achievements their participation in catchment management forums, in the Gauteng water summit, their field visits to sampling points in the Rietspruit and Vaal River, and a visit to the Rand Water laboratories in Vereeniging to get a better understanding of how water samples are analysed. The waste team did not list achievements, but intended to monitor whether company waste disposal practices were legal, what municipal byelaws actually said, and engaging with reclaimers to improve health and safety conditions. They planned to visit schools, and to establish committees concerned with waste and recycling. They wanted to critically engage with energy from waste issues, including the implementation of CDM (Clean Development Mechanism), and the policy environment for reclaimers.

VEJA also took part in the increasing numbers of policy and implementation decision making processes. These included Environmental Impact Assessments at the Mittal works, landfill development and other applications. VEJA became well established as an authoritative community voice. It participated in the new Vaal Triangle Priority Area Air Quality Management multistakeholder process, to improve air quality management in the Vaal. It remained sceptical of claims that domestic coal burning was a bigger problem than industrial pollution. It became involved in the Boitshepi landfill extension EIA. It participated in a number of policy processes, often with groundWork and other NGOs. As affiliates like the VWCCC continued their weekly meetings and mobilisation around service delivery problems, other VEJA affiliates joined in. These events were also punctuated by interaction with the media.

End game, Easter 2007 – a VEJA response

In 2007, VEJA was put to the test in its ability to defend its members and stand its ground when Mittal Steel pushed hard to relocate the last few families still living in Steel Valley. Families like the Ramodibes and Mkwanazis had refused to sell their properties at the prices Mittal offered, and stayed on in the devastated area where other houses had been demolished and the area closed in. In response, the company appointed an agent acting to access records in the title deeds office. They did indeed find useful administrative loopholes in the property transfer processes regarding the families who refused to be bought out and move out. Lawyers had not completed the title deed transfers into these people's names. The agent followed up to the last seller and official owners and – despite knowledge that the properties had been paid for – acquired them anew from the previous owners and registered them in Mittal's name.

The agents arrived at the house of Rachel Ramodibe, who still lived with her grandchild of the same name, on her plot. They told Rachel Ramodibe that Mittal now owned her plot and house, and would demolish it immediately after the coming Easter. With the help of the legal team, Margie Victor and Raymond Appel – still fighting the case of the remaining 2 of the 16 applicants – an interdict was acquired from court to stop this harassment.

Mittal continued its efforts to remove the four families. The next target was Mr Mkwanazi, who had two houses in Steel Valley. Mittal acquired the title deed of his second house – which he was renting out to tenants – and demolished it together with the dam (reservoir) which held water for his herd of more than 60 cattle.

Fig 9.3 Steel Valley Day of Remembrance on Strike Matsepe's smallholding. Picture Victor Munnik

They then turned their attention to the cattle, and impounded 58 cows in the weekend after Easter. The cattle were chased to Mittal's kraal in Steel Valley, and then trucked out to faraway Lichtenburg. Their explanation was that the cattle had trespassed onto Mittal's land, which they argued included the roads and verges "acquired" from local government in addition to the smallholdings bought out (in lieu of the water provided by ISCOR to families with contaminated boreholes). Mkwanazi had to pay R35 000 to get the cattle back (including transport and pound fees). In the meantime, the calves that had remained behind were starved of mother's milk. Someone – possibly Mittal officials – then alerted the SPCA that the calves were in a bad state, and they arrived at the homestead of Mr Mkwanazi.

When alerted to the situation, VEJA played a strong role in defending these members of the SVCC. On 22 May 2007, the Steel Valley Crisis Committee, the Vaal Environmental Justice Alliance and groundWork brought together around 50 previous and current Steel Valley residents in a Day of Remembrance on Strike Matsepe's farm (Fig 9.3). Wooden crosses were planted and a prayer service held for the many residents who became sick and died as a result of the pollution. It was also a day of solidarity to get media coverage of the intimidation, in the hope that this may inhibit Mittal. The solidarity became international as the intention to initiate a global Mittal Watch was announced (see below for an account of the Mittal Watch). The day before the meeting, Mittal's farm managers made an attempt to impound Strike Matsepe's cattle (Matsepe, personal communication, 22 May 2007). By the time of writing in 2011, only Matsepe's relatives remained in Steel Valley.

VEJA's Day of Remembrance embodied an important aspect of its strategic approach: that of refusing closure. In this, it found useful allies with a similar intention not to accept the imposition of injustices in the present, and the denial of the injustices of the past, in a broad international movement.

Solidarity on a global scale

Since its inception, VEJA interacted with other fenceline communities and extended support to them. This process continues to today. In 2005, VEJA extended solidarity to veteran Steel Valley campaigners Johann de Kock's constitutional court challenge against the Steel Valley pollution and buy-out. VEJA members arrived to be present in court, and in an impromptu meeting at the court afterwards, promised their support to De Kock's efforts. VEJA has become a fully-fledged and active member of the loosely knit South African Environmental Justice movement, attending most of its meetings including groundWork's annual corporate accountability (Corpse Awards), meetings of the water and energy caucuses, where water pollution, energy politics in general and climate change specifically are important themes. VEJA undertakes supportive field visits to

other fenceline communities in Sekhukhune, Rustenburg, Richards Bay, Middelburg and other places to in turn support and build capacity. These themes include the effects of coal mining and heavy industry, platinum mining and industry. They actively support the communities on the Far West Rand dealing with the damage of gold and uranium mining there.

In 2007, VEJA became part of a global alliance of ArcelorMittal neighbours worldwide, exchanging information and forming an international pressure group which brings its information about ArcelorMittal's treatment of neighbouring worldwide literally into the shareholders' meetings in Luxembourg. When Mittal "merged" into ArcelorMittal, which was headquartered in Luxembourg and played an important role in the local political life, it unwittingly delivered the Luxemburg green movement as an ally and well positioned base (located next to the European head office of the new ArcelorMittal where its shareholders' meetings take place) to the Environmental Justice movement. The newly established Global Action on ArcelorMittal (GAAM) brought together activists from Ohio, USA, Luxembourg, the Czech Republic, Kazakhstan, Bosnia and Herzegovina, the Ukraine, India and Liberia. It is a growing network that has now produced two research reports, aimed at the media and at Mittal shareholders, detailing the cases of environmental abuses against Mittal fenceline communities worldwide (Aitken, 2008; 2009). It has been successful in terms of media attention and pressure from shareholders on country management to improve environmental management and relationships with communities (Aitken, 2009).

The tactical terrain of a global multinational steel maker

After 2000, ISCOR was globalised in the space of four to five years. The management of the steel factory's logic and approach to environment changed from apartheid arrogance and neglect, softened by some personal understanding of the needs and feelings of its neighbours, through a period of uncertain adaptation to the new South Africa, to that of a

distant, global steel giant. It had become part of a global corporation with a clear disregard for the environment, as will be shown below.

As recounted in chapter 8, the Saldanha Steel mill was built in 1995 in a 50/50 partnership between ISCOR and the Industrial Development Corporation (IDC), aimed mainly at the export market. It started selling steel in 1998, in an extremely unfavourable market with the Asian IMF crisis and the collapse of the Russian economy. New capacity in China, South Korea and Brazil, led to large price reductions in 2000. Domestic demand was not forthcoming either, and by 2000, Saldanha Steel was bleeding the IDC of cash, accounting for 65% of its portfolio and threatening its very existence. The Saldanha debt was R6,5 billion, "the result of high interest rates, cost overruns and technical problems… (as well as)… the decline in world steel prices" (BDFM, 2001, 1).

Worried about the Saldanha haemorrhage, the IDC (still the second biggest shareholder in the privatised Iscor at 15%) looked for a suitable international investor and approached Lakshmi Mittal, an international tycoon with a reputation for buying up unprofitable state-owned steel producers with inherently low cost production bases, like ISCOR, and turning them around through cutting labour and product lines and upgrading technology (Interview with Zav Rustomjee, 2006).

Mittal was described in the *International Herald Tribune* (2006, February 4) as "the world's third richest man, behind Bill Gates and Warren Buffet." The Mittal steel fortune started from a small steel mill in Calcutta that Lakshmi Mittal's father bought and Mittal inherited. In 1976 Mittal bought a struggling company in Indonesia that made rod and wire and had a cheap workforce that made it profitable. Mittal bought up the Caribbean steel industry in 1989 and the Mexican steel industry in 1992. In 1994 Mittal moved into Canada, in 1995 bought a large number of German steel mills, in 1996 Irish steel (with a power station and 15 coal mines). 1997 saw further Mittal expansion into Mexico, Trinidad, Canada, Germany and Ireland. In 1998, Mittal took over Inland Steel, a big US firm. 1999 saw more take-overs in France and the United Kingdom. In 2001, Mittal made acquisitions in Algeria, Romania and other parts of Eastern Europe. In 2002, steel mills

in the Czech Republic and Poland were added to the list. In 2004, Mittal bought out the remaining US steel industry, and his merger with the European company Arcelor, made Mittal the largest privately owned steel company in the world. In 2005, the Mittals bid to acquire Turkey's largest steelmaking plant, Erdemir, as part of a Turkish privatisation drive. In January 2005 Mittal Steel announced the purchase of a 37 per cent share of China's Hunan Valin Steel Group. Mittal Steel, which was formed when Lakshmi Mittal merged his company LNM with US group, International Steel, now operates in 14 countries on 4 continents, with around 165,000 employees. The Mittal Family hold around 88% of the shares. Despite this phenomenal growth, Mittal Steel remains a family business, with its dealings not transparent to the public or even minority shareholders, which has led to bitter complaints from South African minority shareholders (Reutter, 2005; Stefan Cramer, Friends of Steel Valley workshop, Feb 2004).

According to research undertaken by Dr Stefan Cramer for the Friends of Steel Valley,

> "Mittal's business model is to
>
> - buy derelict or ailing industries at minimal cost
> - squeeze substantial donor funding out of multilateral institutions like the IMF and the World Bank
> - engineer quick turn-arounds through global knowledge-sharing, retrenchment, and the ignoring of legacy costs
> - use market monopoly for an aggressive pricing structure
> - and if the turn-around fails, to dispose of the assets quickly and neatly" (Stefan Cramer, Friends of Steel Valley workshop, Feb 2004).

As a result of these strategies, Mittal achieved ultra-rapid growth while, world-wide, the steel industry was shrinking. Cramer argues that Mittal has used international financial instruments to build his empire, making strategic use of the deindustrialisation of the West, and the rapid restructuring in Eastern Europe after the collapse of the Comecon. Cramer argues that Mittal's style is characterised by aggressive labour relations, new marketing practices and creating an upstream and downstream monopoly (Stefan Cramer, Friends of Steel Valley workshop, Feb 2004).

According to Mark Reutter (2005, not paginated):

> "The worldwide move toward privatization provided the political and economic context for their plans. The Mittals often demanded tax breaks from local authorities and international aid from western development agencies as part of their conditions to turn "sick" state-owned steel mills into "entrepreneurial" western-style outfits. Former Soviet-bloc governments obliged; for one thing, the governments were eager to sell their steel assets in order to gain admission to the European Union. For another, the big state sell-offs created a large flow of money that left well-placed individuals and institutions salivating. One of the first examples of Mittal's successful foray outside of Asia was his 1995 purchase of the giant steel plant in Kazakhstan. A product of Soviet state planning, the pollution-filled behemoth had the advantage of being close to raw materials and low-wage labour, and soon it poured out profits by supplying steel to China."

Mittal is also accused of involving politicians in his deals:

> "In 2001, Mittal made a £125,000 (about $235,000) contribution to the British Labour Party. A month later, Labour Party chief and UK Prime Minister Tony Blair interceded on Mittal's behalf to help him secure the purchase of Romania's state-owned steel works. Blair's personal letter to the Romanian Prime Minister argued that Mittal's bid could help Romania gain EU membership. The Romanian press reported that Mittal personally met with Privatization Minister Ovidiu Musetescu and presented a letter of bank guarantees worth $47 million as the first step in purchasing the majority of shares in the Sidex Steel Works. It has since come to light that the Blair government supported international loans worth hundreds of millions of dollars to assist Mittal's growing chain of steel mills" (Reutter, 2005, not paginated).

Mittal in South Africa

In Mittal's strategy, the possibility of buying steel mills cheaply depends on being able to ignore the legacy costs. This strategy depends on the co-operation of the national state, and that this can be seen in the South African case.

Within less than four years of his first engagement, Mittal took over ISCOR. In 2001 ISCOR entered into a three-year Business Assistance Agreement (BAA) with Mittal's LNM**.** LNM also bought 34.8% of the issued shares in ISCOR on the Johannesburg Stock Exchange (JSE). In terms of the BAA, LNM provided business, technical, purchasing and marketing assistance to ISCOR, improved efficiencies and introduced cost-savings. By receiving new technology and skills from a global partner it was believed that ISCOR could participate more effectively in the global steel industry (Rustomjee, interview 2006). At the end of 2003, Mittal, having achieved the specific threshold cost saving levels at ISCOR, was rewarded with R1,3 billion. Trade union Solidarity's Dirk Hermann described this as "possibly the largest consultation fee in history" (Crotty, *Business Report*, 2004).

As part of the BAA, LNM had undertaken to further invest in ISCOR shares and in February 2003, LNM increased its shareholding to 47%, following an offer to minority shareholders. By October 2004, LNM was holding 47.23% (the second largest shareholder, the IDC, by then had 8.79%). LNM applied to the South African competition tribunal to become the majority shareholder, holding 50%.

The merger was sharply opposed by two trade unions active at ISCOR, NUMSA and Solidarity. NUMSA argued in front of the SA competition tribunal that ISCOR had reduced its work force from 44 000 in 1980 to 12 200 in 2004 and that it feared further job losses. Solidarity argued that Mittal had a reputation for laying off workers as part of his "turn-around strategy" for newly acquired steel mills. The tribunal dismissed their concerns by pointing out that the bulk of the jobs had been cut before Mittal had arrived, in other words by the old ISCOR management. The take-over went ahead, and ISCOR

Vanderbijlpark, along with the plants in Vereeniging, Newcastle and Saldanha, was globalised as part of the biggest steel empire in the world.

Mittal maintained that he was investing in South Africa for the long term, a total of R9 billion: R8 billion for expansion and R1 billion for various "environmental improvements". Some of the environmental investments are merely upgrades of productive capacity that should have been done long ago, while activists suspect that the expansion overall would impose a bigger environmental burden than is already the case.

Mittal repaid the largesse of the South African government by ignoring its developmental ambitions, in which his steel company was expected to play a supportive role (see Creamer, 2004). Instead, it embarked on a strategy of "import parity pricing". This allows a firm, like Mittal Steel, to make domestic customers pay for imaginary costs on the fiction that the steel has been brought to South Africa from overseas, has been off-loaded in a harbour, where it attracted a 5% import duty and gone through paperwork, after which it was transported inland (Murgatroyd and Baker, 2010). In reality, the steel is simply loaded on a truck and delivered. This arrangement allows Mittal to add around 30% to the price of domestic steel.

Economics professor Simon Roberts of the University of the Witwatersrand argues that, as a result, none of the advantages of cheap iron and years of government subsidies to ISCOR are now passed on to downstream producers making products from steel. These downstream producers are now uncompetitive in regards to overseas producers. This locks SA into its old and undesirable role as exporter of raw materials like steel, and importer of steel products, which sacrifices SA jobs and will lead to deindustrialisation (Roberts, interview, 2006).

Global solidarity

As recounted above, VEJA became part of a newly established Global Action on ArcelorMittal (GAAM) which brought together activists from Ohio, USA, Luxembourg, the Czech Republic, Kazakhstan, Bosnia and Herzegovina, the Ukraine, India and Liberia. GAAM created two dossiers with experiences from South Africa, Ohio (US), Romania, Orissa in India, Ukraine, Czech Republic, Kazakhstan, Bosnia and Herzegovina (Aitken, 2008; 2009). The dossiers were presented to ArcelorMittal stakeholders.

Internationally, activists also became aware of common features of Mittal's approach. As Aitken (2008) concludes:

> "The case studies in this compilation show that the pollution, health and safety and labour problems experienced by neighbours and workers at ArcelorMittal plants formerly owned by Mittal Steel are more than occasional blips. Rather, they represent the logical conclusion of the company's strategy of buying old, heavily polluting steel mills and taking cost-cutting to its extreme" (2008: 35).

A consequence of the international engagement was a renewed willingness of ArcelorMittal in South Africa to talk with local activists. This was a direct result of the Luxembourg engagements, possibly an instruction from head office. So far these talks have centred on workers' compensation – the old VWCCC issue, on the release of the Master Plan continuing details of pollution and plans for remediation, and on Mittal's corporate social responsibility in general.

VEJA's international visits have included Liberia, Nigeria, India and Kazakhstan. These international engagements vastly extended VEJA's discursive resources. Some of it was very practical. An interesting use of global networks from below was evidenced in the Legal Resources Centre (LRC) acting for VEJA and groundWork, in demanding that proposed new expansions at Vanderbijlpark should be reconsidered within an overall

emissions reduction plan for the whole plant, and that such a plan should be included as a set of conditions in the official certificate permitting the extension, thus limiting emissions (Legal Resources Centre, 2006: Comment on the draft Environmental Impact Report (Dated March 2006): Mittal Steel Vanderbijlpark Steel Proposed Two New Rotary Kilns for Direct Reduced Iron).

The LRC requested Dr Mark Chernaik, staff scientist at the Environmental Law Alliance Worldwide, to evaluate the proposed plant. Dr Chernaik found that Mittal Steel Vanderbijlpark Steel (MSVS) was

> "…a second-class facility that releases substantially more pollution on a per capacity basis than comparable facilities elsewhere in the world… on a conservative calculation, not taking into account the full extent of MSVS's increase in PM10 levels or future population growth in the affected areas, over the next 20 years, more than 33 people in Boipatong and northern Vanderbijlpark will die prematurely because of the existing emissions from MSVS" (Legal Resources Centre, 2006: Comment on the draft Environmental Impact Report (Dated March 2006): Mittal Steel Vanderbijlpark Steel Proposed Two New Rotary Kilns for Direct Reduced Iron).

Not only technical, but also political and tactical analysis was exchanged, building solidarity by understanding the polluter's tactics worldwide. In its report *Smoke and Mirrors*, (Ilg, 2003) the Ohio Citizens Action group, analysed Mittal's strategies by comparing him to "a 19th century "cowboy capitalist", arguing that his business approach included:

1. "Centralization of power in a single person, who exercises authority over the smallest details, and a tight hold on ownership and top positions – often extending to outright nepotism.
2. A drive to expand market share at all costs.
3. Obscene displays of wealth to gain entry into the circles of high society where they otherwise would not be welcome.
4. An appalling toll in injury, illness and death." (Ilg, 2003: 26).

The Ohio Citizen Action group's report (Ilg, 2003) also presented a response to "greenwashing" or misleading claims of environmental responsibility by Mittal and his public relations fronts:

> "Neighbours of Mittal Steel's Cleveland Works don't need a citizens' audit to know that they are suffering from the effects of pollution from Mittal Steel. Metal flakes on their homes, cars, and children; headaches from rotten egg smells; zinc and manganese found on and inside their homes; and doctors telling them to move away for the sake of their health are certainly enough. But Mittal Steel Cleveland uses smoke and mirrors to act as though their pollution is not a problem" (Ilg, 2003:3)

According to this report, Mittal's methods include using "average emissions factors" rather than real pollution figures, not testing polluting units, like its blast furnaces, arguing that the technology for proper pollution control is not available, while it is, claiming flaring as a pollution control device, and reporting investments in environmental projects without disclosing the budget, timetable, or ways they will measure the effectiveness of such projects.

For VEJA, the international co-operation within GAAM confirmed a number of strategies of ArcelorMittal, after ISCOR had become part of a global steel maker and operated more in the logic of a globalised corporate. The reports shared by other activists brought to their attention that Mittal had bought into a number of steel mills with pollution legacies, but did not address them. Where Mittal did come under pressure to do so – in Cork in Ireland – he withdrew rather than do so (O Connor,2004).

In all cases, workforces were dramatically reduced in numbers, in the interest of "productivity". In some places, like Ostrava in the Czech Republic, this led to overtime work and extra downward pressure on safety and environment standards (Aitken, 2008). Mittal accepted large funds from international banks like the European Bank for Reconstruction and Development, for raising environmental standards. In some cases, there were investments in environmental aspects of production, but, argue Aitken and

others, these were cancelled out in doubling of production (Aitken, 2009). Overall, there were no noticeable improvements in ambient environmental conditions around Mittal plants. In many cases (Ohio, USA and Kryviy, Ukraine) pollution limiting devices are switched off at night, in the interest of faster production and energy savings. There is a clear international pattern of sacrificing the environment and workers' health for profits (Aitken, 2009).

The publication includes many examples of the usefulness of the regulator. In many cases, ambient environments are tested for air pollution, and the results are known to and used by local activists. In other cases, national regulators and politicians have attempted to act against the polluter, but failed, as political will is not sufficient.

Conclusion: Working with discursive resources

Steel Valley residents, now united with other fenceline communities in the Vaal Triangle through VEJA, and linked through bonds of solidarity, resource sharing and information flows to other communities on the fencelines of Mittal's pollution, developed a different approach to discursive power from the approach followed by the Steel Valley residents before 2000.

The VEJA approach is explicitly located within the framework of Environmental Justice. Pollution is thus seen within VEJA and in its activities, as an externalisation of costs, a transfer of wealth, an ongoing act of theft and a crime. Exclusion from decision making processes around pollution is seen not as accidental, but as a deliberate act of exclusion which will lead to more pollution.

VEJA actively accessed and built up discursive resources. It invited and recruited expertise on steel making processes and pollution from a wide range of individuals, whistle-blowers, national and international EJ movements. This included knowledge held by fenceline communities in other countries where Mittal also operates, including

technical information comparisons, and comparisons of tactics. An important factor here was solidarity. It built its own capacity and knowledge, through various workshops and trainings. This helped VEJA to understand what technical proposals mean and how to judge them, to be able to participate in processes, and to avoid lending legitimacy when participants did not have enough understanding. VEJA consciously built on pre-existing discursive resources, including the radical political tradition in the Vaal (discussed in chapter 4); resources built up in South Durban, e.g. their constitution, role divisions, how to handle issues that arise through mentorship from the South Durban Community Environmental Alliance (SDCEA), as well as resources within the international EJ movement.

These strategies and activities built confidence and an authoritative voice for VEJA. It resulted in activists being able to monitor and work with the regulator. This became an important strategy which in turn built more profile and authority for VEJA. VEJA invested heavily in building the authority to speak and be taken seriously. By establishing an office, making it continuously contactable, with an organiser and office staff, a logo displayed on letterheads and t-shirts etc., it acquired an institutional identity. This was anchored in a governance system, which was representative of its affiliates, which in turn came from a broad base of other fenceline communities. VEJA thus positioned itself to talk on behalf of environmental activists in the Vaal and became impossible to ignore or side-line. With this authority, it entered a number of arenas successfully. VEJA engaged the polluter, now called ArcelorMittal, directly, internationally and locally. It engaged in meetings where it demanded access to specific information, e.g. the Master Plan, and opened the door to compensation for ex-ISCOR workers. Its international meetings with ArcelorMittal shareholders and top level officials in Luxembourg translated into pressure in South Africa for Mittal managers to meet activists.

VEJA continued to pursue public opinion through maintaining a presence in the media, and responding to developments, such as the ArcelorMittal attempt at getting rid of the last few residents of Steel Valley. VEJA also continued with a series of demonstrations and protests. Demonstrations, as the word suggests, is a very discursive tactic. It

communicates disapproval and confrontation, and because of its material and visual nature, alerts public opinion. In the ArcelorMittal situation, it serves to shatter greenwash complacence.

VEJA refused to accept closure on the injustices in Steel Valley, and despite the best attempts of ArcelorMittal, kept the debate and the memories alive. Community organisations and activists showed a refusal to accept closure (and reification) as well as to accept the enclosure of the Steel Valley area. This is understandable from a number of perspectives:

- The pollution, once in the groundwater and soil, is ongoing and moving inexorably towards the Vaal River itself.
- The pollution is not being reversed, and won't be unless public pressure forces it to happen.
- The effects of the pollution on loss of health, livelihoods and community are still being felt, keeping the pollution issues alive.
- Tactically it does not make sense to allow the polluter to close the issue.

The emergence of VEJA from the Steel Valley struggle shows that an Environmental Justice response to the pollution was possible, and indicates what the components are: spanning the spectrum from institutional, to material, to discursive actions. It is driven by national and international solidarity, which has improved the strength of the victims of pollution in ongoing discursive contests. It shows that the pollution dispositive at work is Steel Valley is not absolute and all-powerful. There is space available in the media and public opinion, there are a large number of fenceline communities worldwide, and solidarity between them is possible and fruitful, strengthening the EJ movement and perspectives. There is space within regulation and the state, and EJ activists and fenceline communities can use this. The nature of this space is one of the topics of the next and final chapter, which brings together insights into the pollution dispositive at work in Steel Valley.

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They say they have been poisoned by an industrial giant, which now wants to move them, but these residents of Steel Valley are …

CRUSADE: Caroline Ntaopane is part of the Vaal Environmental Justice Alliance, which wants Mittal to own up to – and right – its wrongs.

EVICTION BATTLE: Rachel Ramodibe (68) is awaiting a High Court decision on whether she must leave her Steel Valley home.

FURY: Steel Valley resident Strike Matsepo (77) says Mittal "put the poison here" and now want to "kick us off our land".

ACTIVIST: Samson Mbele of the Vaal Environmental Justice Alliance says they will use the constitution to achieve justice for the people of the Vaal.

Determined to prove their mettle to Mittal

BY UFRIEDA HO

Another day and another plea falls on the ears of men who still look like saviours to those who have forgotten what hope looks like.

Today it's a plea from Strike Matsepo, a Vanderbijl Park resident, who says he is being choked off his land in the Steel Valley area, where he has lived for the past 14 years.

"I want Mandela and De Klerk to help me. They must stop Mittal from poisoning us and killing my cattle," says Matsepo, as he shoos away a scrawny chicken in his yard and looks across the way to a slagheap belonging to his neighbour, the giant multinational steel company, Mittal.

"They put the poison here, then they want to kick us off our land and don't want to pay for making us sick," says the 77-year old.

He bought his plot as the dawn of a democratic transition made it possible for him, as a black man, to buy land. It was a moment of personal liberation and the realisation of a dream to farm, to raise livestock and to live out his old age peaceresponsibility to stop its polluting operations and to stop its bullying tactics in trying to get rid of the families who won't agree to sell.

Two other remaining locals are Rachel Ramodibe and Johannes Mkwanazi. They are currently under threat of eviction and have court cases pending. Both say Mittal has used underhanded means to try to obtain their properties, has exploited irregularities in the transfer of title deeds they say they've owned since the mid-'90s. Lawyers working *pro bono* for the families had to bring an urgent interdict against Mittal just before Easter to stop Ramodibe's eviction. The High Court decision in this matter is expected next month.

The pair believe it's just part of the never-ending cycle of intimidation from Mittal. Mkwanazi says his cattle were impounded by Mittal on the charge that the animals had trespassed onto Mittal's land. He had to pay R35 000 to have the cattle returned.

> **It was a bad deal, but we had to settle and try to start again**

"Mittal goes behind my back to buy my house, but the banks never told me there was a problem with the title deed.

that we set up, which we think are the right platforms through which to engage," says Didiza.

He adds that their complete environmental reports are available to the public and denies that Mittal has been hostile with the residents.

In the case of Ramodibe, he says: "It's unfortunate that she was misled when she bought her house from someone she thought was the legal owner. Our consultant was visiting her to give her notice to move, she was not being threatened."

Didiza also refutes that they reported Mkwanazi to authorities or to the impounders to have his cattle removed.

However, Didiza tells of Mittal's loss of cattle on their land, which now totals around 2 000ha. They have previously placed game and then cattle on the land but electric fences have been broken and the livestock stolen.

Mittal's plans are to continue using the land as a buffer zone and to raise cattle for the beef market. This, Didiza says, is further proof that the land is not so polluted that healthy cattle cannot be reared there.

But Mbele disagrees. In the shadow of Mittal's billowing smokestacks, he points out drainage channels where effluent and other waste water leaves Mittal. "The stream that trickles past is pernicious, he

Fig 9.4 VEJA activists continue the struggle against ArcelorMittal. The Star, May 24, 2007. Article by Ufrieda Ho, pics by Sizwe Ndingane.

Chapter 10: The pollution machine at work in Steel Valley

Introduction and overview: adding up to a pollution dispositive

This final chapter brings together the insights about strategies and tactics of discursive power developed in earlier chapters; to venture a description of the pollution machine as it became visible, but also as it developed, during the Steel Valley challenge. With this description, it becomes possible to understand the apparently unreasonable events in Steel Valley with which this case study opened: why it was possible to deny the existence of the pollution, get away with such apparently unreasonable denial, and to escape liability for the pollution. It is also from this understanding that the two next steps flow: describing a strategic terrain for EJ activists and identifying other cases of fenceline communities confronting the MEC, in which this logic may apply.

The polluter's success in denying the existence of the pollution, and escaping liability for it, was the result of the use of discursive power:

1. the discursive resources that were available to the protagonists,
2. the nature of the arenas in which discursive encounters were decided, and
3. How these resources were used in the strategies of the three protagonists.

The detail of previous chapters is brought together in a single, strategic description of the discursive battle in this chapter. In this description a picture emerges of a more complicated, dynamic, interdependent and heterogeneous web of resources, arenas and strategies: court cases, media articles, company newsletters, factories, pipes, canals, laboratories, water treatment works, maps and notes, visits to doctors and lawyers, meetings and local government administrations, government declarations, inspections and correspondence, environmental impact assessments, property valuations, physical removals, bulldozers flattening houses, electric fences etc.

These are all elements of the Steel Valley pollution dispositive that practices, disputes, regulates and legitimates pollution. *It is a pollution machine that operates as part of the Minerals Energy Complex, but now in a sophisticated and reformed version as a result of the battles that have been fought in it.* As compared to the pre-existing MEC pollution practices, it has undergone changes in production processes, in rhetorical responses and in developing a way of dealing with pollution legacy issues that are now prominent in the MEC, e.g. the current acid mine drainage problem (Coetzee *et al*, 2010). *The dispositive is dynamic, and changes in response to changes in its context and pressures exerted on it.* Indeed, these pressures become part of its internal logic, which allows for an activist approach that engages with the dispositive.

In analysing a dispositive, attention should be paid to the knowledges (or what this thesis called discursive resources) that animate the discursive and non-discursive practices as well as the materialisations of the positive (Jaeger and Maier, 2009). *Discursive resources are the central dynamic components of a pollution dispositive.* An example of such analysis was given in **chapter 3** (methodology), where the creation and deployment of a "native question" - the discursive work of legitimating migrant labour and later apartheid to serve the MEC – was discussed in the work of Ashforth (1990). The discussion identified a range of knowledges – Afrikaner anthropology ("*volkekunde*"), Afrikaner theology (Calvinist based Christian Nationalism), Fordist management science, the experiences and discursive resources of racism, a spatial ordering based on race and proximity to work, and others that formed part of the MEC labour dispositive. A more material analysis would have included the compound system and its architecture, the institutions, from revitalised tribal structures to labour offices and transport routes, as well as the migrant labour cultural responses that formed part of this complex.

In a similar way, this chapter describes the core characteristics of the *Steel Valley pollution dispositive*, while exploring its background and conditions of possibility. It pays attention to the histories and internal dynamics of broad institutions that constitute the pollution dispositive and the discursive resources and strategies that sustain them: the discourses that produce *disposable others*, whether through racism or a view of

dispensable fenceline communities; the legitimations and limitations of the *politics of hegemony*, and the discourses of *growth* and *limited corporate liability*, as well as of *environmental management, sustainable development* and *ecological modernisation*.

It explores the implications of this analysis for Environmental Justice tactics in the areas of environmental management, *citizen science*, the politics of ecological modernisation, and the politics of hegemony in the new South Africa.

Finally, chapter 10 reflects on whether the case study achieved its objectives as set out in chapter 1. It asks whether the events and outcomes in Steel Valley were adequately explained by this study, and whether the EJ understanding of role of discursive power was usefully extended. It looks at possible application to other situations, where fenceline communities respond to pollution imposed on them by the largely extractive and mostly highly polluting industries constituting the MEC. It closes with a consideration of the theoretical and methodological contributions to the analysis of pollution achieved through this study.

The discursive battle for Steel Valley

In the first few years of the new South African democracy, the polluted residents of Steel Valley challenged ISCOR and the state for compensation, rehabilitation and an end to the pollution. Their quest for Environmental Justice was frustrated by an invisible web of interests, agendas, rules, knowledges and powers that produced the opposite from what the new constitution had promised them: the right to live in a healthy environment.

As Steel Valley residents challenged the pollution, they built up an increasingly sophisticated picture of the pollution by the steel mill. Their engagement in public forums led to the revelation of the DWAF archive, which continued a history of pollution and state responses to it, as discussed in chapter 5. It consisted of official correspondence, minutes of confidential meetings, scribbled notes that departmental officials did not expect to become public, consultants' reports that detailed sources of pollution, official

concern about it, detailed technical descriptions and proposals from ISCOR to improve the situation. The archives were made available to participants in a series of forums in which residents, ISCOR and government officials attempted to find solutions to the pollution problems.

As the residents produced their own discursive resources from these efforts, they shared their experiences and interpretations with the media, who presented these to public opinion in convincing terms. Residents also challenged ISCOR directly, in two court cases, both based on this information about the existence of the pollution, as detailed in chapters 6 to 9. As ISCOR resisted their quest, the invisible web that legitimated the unlikely and the unjust, came into view. At the same time, as the steel factory's managers and owners responded to the challenges of the polluted community *a new pollution dispositive came into being*: a refinement of the blunt legitimating strategies of the old ISCOR at the end of apartheid, into a sophisticated approach that could *legitimise pollution within the new politics of hegemony accompanied by a new framework of human and environmental rights.*

The citizen challenge showed mobilisation first across racial barriers in a racially segmented society and then on an international scale. A new, more sophisticated understanding of Environmental Justice developed and citizens joined in a global alliance monitoring the ArcelorMittal steel giant's operations across the world in concert with other fenceline communities. These communities, together with others in the Vaal, realised and internalised their status as fenceline communities and as part of a global Environmental Justice movement. In part, these developments were made possible by the South African political transition, which created the rights to organise, to have representative local government, the freedom to express public opinion as well as the space to contest decisions under new environmental legislation. They were also made possible by the Steel Valley pollution struggle itself, in the affected communities and through the solidarity of other Environmental Justice activists.

ISCOR's strategic response developed over time, and as a result of these challenges. At first, ISCOR was slow to react to the changed discursive circumstances. It continued its old strategy of legal defence and buying silence. With the Johnny Horne court case, it settled out of court and avoided a precedent setting finding against itself. In the case of the 16 applicants, it legally muzzled its opponents from talking about the court case – only to provoke the formation of a very vocal Steel Valley Crisis Committee which became the mechanism that linked this struggle to a worldwide Environmental Justice network. ISCOR then *embraced ecological modernisation*. It framed its engagement with the regulator in terms of a comprehensive Master Plan, which also enabled it to corral scientific expertise under its control, through professional confidentiality agreements. Within the trajectory laid out in the Master Plan, ISCOR and later ArcelorMittal embarked on a programme of ecological modernisation, meeting the demands of the state as regulator, which were more limited than those of the community.

The state played a restrained and ambivalent role: while it pushed for improved environmental management and pressured ISCOR to reduce future pollution, it retreated from its role as citizens' representative in their battle for justice, compensation and defending them from losing health, wealth and community assets. This was, as will be argued below, both revealing of the South African state's dependence on and collusion with the big players in the economy, as well as a development in political culture as choices were made in favour of growth and against the environmental right. In this it was served well by a discourse of sustainable development that retained a core commitment to growth combined with a legitimation of that growth through redistributive strategies. The state lent its legitimation to ISCOR and more broadly to the MEC.

Discursive power played a major role in the Steel Valley case. It was discursive power, not coercion, not settler, police or military confrontation, that led to the material outcomes in Steel Valley: the removal of the community and destruction of houses, the enclosure with electric fences, including the verges, the decision to deny compensation and the medical trust, the decision to exclude areas that were polluted from the buy-out process - although of course these developments were enabled by the material power to

pollute, enclose land and evict people. *Discursive power was used by the polluter to escape liability, by maintaining scientific and legal uncertainty about the nature, extent and consequences of the pollution. Discursive power enabled the polluter to frame the problem as a technical one from which social justice concerns, like compensation, could be excluded.* The Steel Valley residents thus lost this discursive battle, although their efforts resulted in ecological modernisation (a partial victory) and the building of an international solidarity network with other fenceline communities facing similar pollution.

The polluter's victory depended on a constellation of discursive conditions in scientific, legal and administrative arenas. The next section brings this constellation into closer focus.

The pollution dispositive at work in Steel Valley

The pollution dispositive did not materialise from thin air. It was composed of pre-existing resources available in its environment: the global discourses constituting environmental management, ecological modernisation, sustainable development and growth, and the legal practice of limited liability. The following sections explore how these resources gave the Steel Valley pollution dispositive its power.

The MEC and its dispensable others: fenceline communities

As much as the state, ISCOR and the communities challenging the pollution acted according to their own strategies, they also had to act from the basis of a pre-existing history: the fact that Steel Valley, ISCOR and the state's regulatory approaches had developed first as part of the Minerals Energy Complex. The MEC was historically based on extractive industry: coal and gold mining, with attendant very strict control over cheap black labour and a political system which made that control possible (Fine and Rustomjee, 1996; Yudelman, 1984). The MEC created radical changes in landscapes as a

result of the massive production of waste by mining, the attraction and settlement of a racially segmented labour force, which was reinforced by apartheid spatial structuring since the 1950s, as well as a lax environmental regulation regime (Hallowes and Munnik, 2006). In the Vaal Triangle and in Steel Valley its effects were those of a giant pollution producing machine (this is explored in detail in **chapters 4 and 5**, and not repeated here). The MEC also established a pattern of powerful conglomerates dominating South Africa's political economy, financially strong, with huge staff complements, political influence, and with the means and the disposition to contest attempts at regulation as well as citizens asserting themselves (Fine and Rustomjee, 1996; Innes, 1984). This configuration was described in chapter 4. Here the focus is on describing the continuities from the MEC as a dispositive focused on cheap black labour, to a pollution dispositive.

A central continuity is its treatment of people as disposable others, first in seizing power over their bodies directly (Loebell, 2005), then in disregarding the effects of the externalization of pollution on people's environments, in the case of Steel Valley at work and at home, as well as on the bodies of the people who live in those environments (chapter 7). Bernard Magubane in his *Racism and the Dispensable Other* (Magubane, 2007) shows how racism in its dominant form in South Africa resulted from colonial exploitation of black people and their resources. Racism was a necessary instrument to early capitalism because it legitimated and facilitated slavery, which operated through direct physical control of the bodies of slaves and their daily lives, and the takeover of political structures and natural resources through colonialism. As was noted in **chapter 4**, the MEC followed on and built upon the knowledges generated through earlier colonial impositions, specifically the slave trade and the trade in hunting products.

The second Anglo-Boer War (1889-1902) was in essence a war to create a political economy in which gold mining was possible and profitable (Turton, 2006; Lester *et al*, 2000). In its aftermath, racism was entrenched through a system in which white labour was rewarded to oversee black labour in the workplace and in the political system (Von Holdt, 2003; O'Meara, 1996; Yudelman, 1984). From the perspective of the pollution dispositive, the practice of racism laid the foundation of the imposition of pollution on

neighbouring communities. The bodies of black workers in the compound system and at work were exposed to polluting environments (Loebell, 2005; Hlatswayo, 2004). Townships neighbouring on the steel factory were by design exposed to pollution (Hallowes and Munnik, 2006).

Both colonial racism and apartheid Fordism operated with an ongoing construction of the dispensable other: *an other who is viewed in purely instrumental terms as a source of labour and an object to be controlled politically*. It is an extreme example of monologic communication which denies the right of the other to choose a role, to exist, to speak and decide (Bakhtin, 1984). The imposition of pollution costs on fenceline communities continues the practice of viewing the other as disposable. The Environmental Justice movement recognizes this, most strongly in its analysis of "exclusion from decision making", and in its own historical conceptual continuum from environmental racism to Environmental Justice. This thesis has not unpacked the class/race debate, since this has not been a focus. However this could be fruitfully pursued by other scholars. The practice of treating others as dispensable continues in modern democratic capitalist society where some decision making is democratic, a large amount of economic decision making is not, and is also not in the interests of all in a risk society: a society in which an elite makes all economic, production and pollution decisions (Beck, 1992; Offe, 1984).

The MEC created fenceline communities, both black and white. They become *fenceline communities "for themselves"* when citizens come to understand their risk position in the political economy. During the time of apartheid, the political discursive resources of the communities were built, and could later serve as a basis for Environmental Justice, just as the Environmental Justice movement in the US was built on the basis of the civil rights movement. One outcome of this process in post-apartheid South Africa was the writing of the environmental right into the constitution. But the establishment of this right was also part of a broader, and in many aspects much more ambivalent engagement with environmental management imperatives and their legitimating opportunities, which serve in practice to limit citizens' environmental rights, as will be shown below.

The power of environmental management and science

The most decisive discursive event in the Steel Valley case was the Master Plan. It served to replace the official regulation process with a framework for regulation and remediation that was designed by ISCOR to suit its own purposes. Through it, *ISCOR re-established itself as the arbiter of how its own pollution should be managed*. The discursive power of environmental management was harnessed by ISCOR, and accepted by the regulator.

Environmental management, with its combination of legitimacy and overpowering knowledge, is the discursive glue that holds together and enables the operations of the pollution dispositive. This apparatus brings together expertise on many levels, as foreshadowed in the logic of Agenda 21 (UN, 1992), and elaborated in the broad definition of environment including the social environment: creating inclusive processes in which everything is considered, and the answer is "legitimate" because the process was legitimate, for example Environmental Impact Assessments (EIAs). These methods do not always lead to legitimacy because they can tend to ignore uncertainty and conflicting social agendas (Jasanoff, 2003). These aspects were discussed in **chapter 1**.

Environmental management also has important limitations when judged from the side of Environmental Justice, or even in the narrower terms of ecological efficiency. Firstly, intervention is only justified when there is clear evidence of serious damage, requiring strong scientific evidence. Secondly, trade-offs need to be made between economic growth and environmental quality, because these are thought to be zero-sum variables: the one can only be had at the cost of the other. Thirdly, the calculation of these trade-offs depend on engineering, economic and eco-scientific expertise, which puts these decisions firmly in the hands of experts and the big institutions of the state and corporate business with the means to control these carriers of expertise (Harvey, 1999; Schnaiberg, 1980). In equal measure, these decisions are removed from the public, including from affected citizens (Jasanoff, 2003; Irwin, 1995). In the Steel Valley case, it was the ability

of ISCOR to maintain scientific uncertainty about the reality, extent and causes of the pollution that characterised its environmental management.

ISCOR maintained the uncertainty about the pollution through its control over scientific discursive resources. Its control was direct in the Master Plan, and indirect in its tacit, legal and quasi-legal control over scientists as well as over the scientific evidence in the possession of the regulator. The effect of this control was to maintain, if not increase, uncertainty about the existence of the pollution, and to frustrate efforts to prove in court that the pollution was real and imposed a liability on ISCOR.

Experts are not simply wilful and obstructive when they insist on reaching scientific certainty. Experts can literally be disciplined within their disciplines, and this applies especially to the issue of certainty. They are loath to make pronouncements without qualifying them, as this might invite criticism from scientific colleagues and damage their reputations and careers. This scientific caution in pursuit of scientific certainty tends to place the regulator on the defensive, argues O'Riordan (1995). He quotes an argument by Wynne and Meyer (writing in the New Scientist of 5 June, 1993 under the title "How science fails the environment") in which they "echo the environmental activist" in arguing that:

> "research seeking a high degree of control over the system being studied, and which enables precise observations of the behavioural correlations between a small number of variables, draws the regulator into restricting only those relationships where cause and effect can either be proved or shown to be reasonably unambiguous."

Consequently, regulators tend to play safe and stay within the area of the scientifically defensible while doing their jobs, fearful of legal challenges that can carry a high price in staff time and legal costs. As a result, "… the very essence of the scientific technique becomes a political weapon in the legal culture of appeal and ministerial determination of environmental quality" (O'Riordan, 1995: 1), a weapon that is wielded with great skill by corporations dodging liability for their pollution, as was shown in **chapter 8**.

Activists have challenged this use of scientific certainty, and national and international decision makers have considerably weakened its hold on environmental decision making processes, at least in theory (Harremoes *et al*, 2001; UN, 1993). Scientist activist Davis is critical of the standard idea of achieving scientific certainty before acting on hazards:

> "When it comes to hazards in the workplace and environment, the safe response, which has come to be accepted as scientifically responsible, is to say nothing and do nothing until we have clear proof that the hazard has actually made people sick. When we can't marshal definite statistical proof of a toxin's specific harmful effect, backed by a clear theory of the mechanism of that effect, it has become standard to say that we simply don't know whether the toxin is harmful or not. The absence of evidence of harm – even when no effort has been made to gather that evidence – becomes grounds for inaction" (Davis, 2002: xviii).

The absence of evidence of harm is not evidence of the absence of harm. Davis argues for the precautionary principle in health:

> "Where the health of large numbers of people is at stake and the harm is potentially irreversible, it is far better to err on the side of caution. We accept this principle in many areas of life: We do not wait for buildings to fall down or bridges to collapse before reinforcing and inspecting them for safety; we do not wait for boats to sink before requiring that they carry life jackets.
>
> "Our knowledge of the health consequences of both local and global pollution is more detailed and accurate than it has ever been. We are now in a position to make informed choices about what risks we will accept and how much we're willing to pay to change them. Some have argued that a dirty world is the unavoidable price of economic growth. Those with a vested interest in not changing the causes of pollution will too often use this claptrap as an excuse for doing nothing and learning nothing" (Davis, 2002: viii)

The age of environmentalism has made new demands on the scientific community that go beyond the practice of "pure science". Chapter 31 of the Agenda for a 21st Century (a major document agreed to by states at the Earth Summit in Rio de Janeiro in 1992)

appeals to the "scientific and technological community", as one of the major groups involved in environmental management, to play an ethical role:

> "Scientists and technologists have a special set of responsibilities which belong to them both as inheritors of a tradition and as professionals and members of disciplines devoted to the search for knowledge and to the need to protect the biosphere in the context of sustainable development… Increased ethical awareness in environmental and developmental decision-making should help to place appropriate priorities for the maintenance and enhancement of life-support systems for their own sake, and in so doing ensure that that functioning of viable natural processes is properly valued by present and future societies. Therefore, a strengthening of the codes of practice and guidelines for the scientific and technological community would increase environmental awareness and contribute to sustainable development. It would build up the level of esteem and regard for the scientific and technological community and facilitate the "accountability" of science and technology" (1993: 241).

The environmental debate introduced a new way of handling uncertainty in science, in the form of the precautionary principle:

> "In the face of threats of irreversible environmental damage, lack of full scientific understanding should not be an excuse for postponing actions which are justified in their own right. The precautionary approach could provide a basis for policies relating to complex systems that are not yet fully understood and whose consequences of disturbances cannot yet be predicted" (UN, 1993: 257).

As risk societies become more knowledgeable about the risks they face, they develop more responsible interpretations of scientific uncertainty and the role of actors like government, the public and corporate risk producers (Jasanoff, 2003; Harremoes *et al*, 2001). These approaches frame scientific uncertainty in the light of risk, and especially the risk of ignorance of certain crucial pieces of knowledge. The idea of ignorance draws attention to the risk of an absence of knowledge. Harremoes *et al* argue for a more explicit and systematic recognition of what levels of proof are needed for decision making, which could include "scientifically based suspicion", "reasonable grounds for

concern", "balance of evidence" and "beyond reasonable doubt" (Harremoes *et al*, 2001). Jasanoff (2003) criticises the "technologies of hubris… that are designed, on the whole, to facilitate management and control, even in areas of high uncertainty" (2003:238) and argues for "technologies of humility", which will…

> "…provide a framework for the questions we should ask of almost every human enterprise that intends to alter society: what is the purpose; who will be hurt, who will benefit and how can we know? On all these points, we have good reason to believe that wider public engagement would improve our capacity for analysis and reflection" (2003: 240).

In the light of the complexity of these issues, the regulator in South Africa, and the courts appeared naïve, if not wilful, in simply using a blanket definition of "scientific uncertainty" in the Steel Valley case – and thus failed their citizens living in an industrial risk society.

The tax-dependent South African state and the politics of hegemony

The pollution machine in Steel Valley was guaranteed its operational environment by a state that legitimates, even as it ratchets up its regulation in a new situation, the ongoing practices of pollution, as argued in chapter 8. Fundamentally the existence of the tax-dependent state is tied to the performance of the formal economy. But this is not unconditional. As argued in **chapter 8** and explored in more depth below, the state needs to provide legitimacy for the formal economy to function *within the real economy*, which includes people's direct experiences of reproduction and subsistence, as well as the home of the economy in nature (Henderson, 1996; Offe, 1984; Yudelman, 1984).

As a shock absorber of popular and political pressure for the pollution machine, the state and the government also transmit some irresistible pressures which may succeed, depending on local tactical conditions, in reforming the pollution machine. These reforms, and the struggles for them, have been described in this thesis as part of

ecological modernization. The state can and does absorb environmental and even Environmental Justice pressures, much of it only rhetorically, as in the constitution, but in the process creating improved environmental management practices and the discursive space for contestations for improvement (Harvey, 1999). These hold the possibility but not the guarantee of ultimately dealing with the underlying causes of the environmental crisis as a society.

The South African state was originally created to serve the needs of the MEC. **Chapters 3 and 4** detailed the creation of a "Native Question" and state structures whose function was to facilitate access to cheap black labour, in addition to a number of other requirements for the mines. As a reminder, these included the

> "transformation of the machinery of state; for a modern bureaucracy particularly a native Affairs Department, an effective police force and an uncorrupt judiciary… the elimination of the concessions policy and the operation of free trade with reduction and elimination of tariffs (and) mechanisms to control and direct labour. … to ensure the reproduction of the work force both black and white, and associated with this the need to reduce the costs of essential foodstuffs, housing, and to ensure health and sanitation… a ring-keeper who would reduce and eliminate competition among themselves, and between themselves and commercial farming and commercial capital… a compliant press as well as a suitable adapted education system" (Marks and Trapido (1979: 63, quoted in Ashforth 1990: 57).

From its inception, this new state had to balance the interests of its two "masters", its legitimacy in the opinion of the white electorate, and meeting the needs of the gold elite on which it was dependent. As David Yudelman describes it:

> "… the developing South African state (in the period 1902-1939), in common with other industrial states elsewhere – was faced with two major imperatives, which were, to some extent, contradictory. In the first place, because it was accountable to the electorate, the state tended to expand its role to all sectors of the economy, and in particular, to politically sensitive areas such as the creation of jobs and the control of conflict between

> capital and labour. Some social scientists refer to this expansion as being part of the state's growing 'legitimation imperative'. In the second place, because growth required financing, the state had to protect its sources of revenue. The South African economy was overwhelmingly dependent on a single product (gold), so the state was even more than usually impelled to intervene in crisis situations to guarantee the gold mines' viability. This second need can be (loosely) referred to as the state's "accumulation imperative".
>
> "… The state's need to mobilize popular support can, and does, bring it into conflict with capital's drive to make profits. But the state also has a vital interest in the profitability of capital, in its ability to be taxed and provide revenue. In other words, there is also an internal conflict within states between their legitimation and accumulation imperatives…. The degree of conflict between the state's legitimation and accumulation imperatives will vary, but the sharper the conflict, the more is revealed about the inner nature of the modern industrial state and where power actually lies" (Yudelman, 1984: 10).

As the Minerals Energy Complex has endured through apartheid and into the new South Africa, the tension between these two imperatives for the state – legitimation versus accumulation - has remained. During the National Party (NP) takeover in 1948, despite their white nationalist rhetoric, leading NP politicians were at first cautious in their approach to the economy (Clark, 1994). The same applied during the ANC takeover in 1994:

> "… When it left apartheid behind, South Africa did not leave behind the structures and processes which generate inequality. It did not enter some 'neutral', post-modern, post-industrial and post-apartheid arena in which it could transcend inherited inequalities and construct a totally revised political discourse and economic structure. Rather, it remains inescapably embedded within a globalized, Western-dominated, capitalist system which continues actively to produce inequalities" (Lester *et al* 2000: 322).

South Africa is not exceptional in this respect as this tension applies to all tax-dependent modern states. According to Offe (1975), the state is profoundly dependent on the accumulation process:

> "In the absence of accumulation everything, and especially the power of the state, tends to disintegrate. If we think of the budgetary obligations of the state… its extensive reliance on resources created in the accumulation process and derived through taxation from wages and profits, this becomes immediately clear. Thus, every interest the state (or the personnel of the state apparatus, its various branches and agencies) may have in their own stability and development can only be pursued if it is in accordance with the imperative of maintaining accumulation (1975: 126, quoted in Szasz, 1994: 32).

Behind this situation is a deeper contradiction in society: between the interests of those benefiting directly from accumulation (the business class) and those who benefit indirectly through legitimation (the economy class). The rhetoric of modern democracies is that decisions are made through democratic processes, while the reality is that crucial decisions about investment, job creation, technology and pollution are in effect made by a small economic elite (Beck, 1992; Offe, 1984). This fault line through modern society underlies the practical challenges of legitimation.

The discursive aspect of the legitimation challenge is summarised in Thompson's (1990) concept of "legitimation": legitimation presents something as worthy of support by all when it is not in the interest of all. The capitalist system of production accumulates wealth in the hands of a few, while draining wealth away from the majority. This continues because the actual functioning of a representative democracy is very different from its rhetoric:

> "democratic government is limited in form and in practice by the existence of capitalism…. formal freedoms and rights essential for an effective system of popular control are insufficiently developed and are further weakened by the lack of social and economic conditions which would enable the majority of citizens to make good use of these freedoms and rights… the actual scope of democratic control is extremely limited (with crucial areas of economic, political and social life escaping even formal accountability)… the freedom of manoeuvre available to the state is constrained by the separation between the economic and political regions and the ultimate dependence of the state on the continued profitability of the capitalist economy" (Jessop, 1990: 171).

This bias in the state towards an elite is recognised by analysts from across the political spectrum, arguing that elite groups typically have more power, because they are more knowledgeable, more connected, better skilled, resourced and organised than poorer groups (Dye, 1992).

The ANC was confronted with these inherited structural constraints as it came to power in 1994. Its first task was to re-establish the legitimacy of the state, which had been thoroughly delegitimised as part of the liberation struggle, but also as a result of the oppressive way in which it operated, through a myriad of discriminatory laws and direct oppressions via arrest, political repression, influx control, discriminatory social provision in education and health and other areas as well as the political structures of the homelands.

When the ANC achieved state power, it worked out a hegemonic project that would be adequate to both its legitimacy and accumulation responsibilities. It developed a ruling discourse (or discourse ensemble of several discourse components wielded together) that would be a workably coherent, persuasive, legitimating expression of a number of solutions to the problem of ruling, some of them contradictory. This high level discourse is a resource or repertoire within which, and with different emphases and creativity, a range of politicians in the ANC, the labour movement and other allies, as well as high level officials can work to explain and legitimate their actions and decisions. Hein Marais described such an emerging discourse reflecting the ANC's politics of hegemony in a new South Africa:

> "One can detect in post-apartheid South Africa the evolution of an ascendant hegemonic project of growing sophistication and vigour. Its many facets converge in a refined and expansive discourse of concessions, affirmations, traditions and innovations that together cultivate an enveloping (though incomplete) sense of common interests and consent…

> "Essentially, it entails modulating capital's 'modernizing" drive in ways that enable the allocation of gains also to other social layers – not least an emergent African bourgeoisie and the black middle classes. The fact that it encompasses pledges, activities and professed ideals that seem to benefit a wide range of classes and interests does not obscure its overriding bias towards the generalized desiderata of capital. These include a rules-based system of governance geared at efficiency, stability and growth, a manifest commitment to a market-driven economic system, and the ability to foster and sustain social unity….
>
> "Naturally, the endeavour also encompasses other essential elements that can address the needs and demands of the subordinate classes. Also, it contains profound features that could enable it to resolve the problem of fashioning an *ideological unity* that registers across the field of society" (Marais, 2001: 233, italics in original).

This discourse is an attempt to establish and maintain a politics of hegemony. It focuses overwhelmingly on economic growth. Economic growth is presented as the precondition for relieving poverty. Economic growth, in the politics of ANC hegemony, is the means of erasing the contradictions between wealth and inequality, while allowing continued accumulation. Economic growth – and the sacrifices to achieve growth - is presented as being in the interest of all. Being against growth becomes literally unthinkable, and as long as that is the case, the pollution dispositive remains able to legitimate itself.

In the past decade, this emphasis on economic growth has materialised as an extension of the MEC by a Black Economic Empowerment elite specifically active in mining, the core of the MEC, and in heavy industry.

The growth and development discourse in the pollution dispositive

The discursive shield that ultimately keeps ISCOR and other corporate polluters from being disciplined by the state, or by citizens, is most fundamentally the growth and development discourse. It propounds the belief that these producers are crucial to the growth of the economy, and should be allowed several freedoms, including the freedom to pollute and get away with it. It derives its hegemony from its promises to not only enrich the rich, but also to lift the poor out of poverty, even as the ever expanding treadmill of production creates more waste, environmental damage and poverty. The growth discourse is constantly reproduced through repetition in everyday media reporting, boardroom talk, classrooms at every level, political discussions and discussions among ordinary citizens, in which the assumption is repeated that economic growth is good and that its desirability justifies pollution. The implications are that the costs of pollution constitute a necessary sacrifice, that there is a trade-off between living in a clean environment and growth, and that some people are unfortunate or naïve enough to live in fenceline communities and suffer the consequences. The knowledge at work here defines a whole field of economic discourses that privilege the formal economy and its indicators, the most important of which is the Gross Domestic Product, as the "real economy".

In Steel Valley, even the opponents of ISCOR's pollution were reluctant to advocate interfering with its ongoing production, for example Neville Felix as described in **chapter 6**. The acquiescence of the trade unions in allowing management to claim all decision making on environmental issues, reflects this "hands off " attitude as well (Sikwebu, 2005) .

The growth discourse is a mixture of two powerful discursive strategies: universalization, in which the interests of a small group is presented as the interests of all, and dissimulation, in which only a part of the whole is presented as a whole, or in which unfavourable information is elided (Thompson, 1990).

The growth discourse confidently maintains that growth in general is good for everybody in general. In these claims it finds a useful ally in the measurement of Gross Domestic Product (GDP). The GDP measures only money flows in the formal market, and then presents this partial view of the economy as a total or inclusive view, on the basis of which economic policy decisions can be made. Henderson (1996) shows clearly that the real economy of a country consists of many non-monetary transactions and productive activities as well, which are not only discounted by this approach, but also vanish from sight when economic decisions are made. So, for example, a non-monetised peasant economy will show as "nil" in GDP, until it is destroyed and taken over by an economic activity – such as a plantation on the land that used to be available to peasant cultivation. As soon as the plantation is dealing through a formal market, the peasants' invisible loss will appear in national statistics as a national gain. This is a clear example of dissimulation, in the form of synecdoche: presenting a part of the whole as the whole. Moreover, GDP is a purely quantitative measure:

> "Scarcely a critic of the ecological crisis has refrained from commenting upon the stupid brutality of this number, which reduces the living and the dead alike to the common denominator of what can be extracted from their commodification. It is necessary, though, to see thinking in terms of GDP as no mere error, but the actual logic of the reigning power; and all cries for revising it to reflect human and ecological judgements are simply risible so long as that power remains in place" (Kovel, 2002: 48).

Another powerful but puzzling metaphor is locked up in the phrase "sustained economic growth". Historically the concept of growth, in economic discourse as well, contained the idea of reaching maturity (Cowen and Shenton, 1996). In nature endless growth is something of a monstrosity, e.g. in disturbed ecosystems. But for many economists and politicians, growth has lost the idea of constraints.

In the combination "growth and development" the growth discourse is even more powerful because it responds to the powerful and legitimate desire of "underdeveloped" or "developing" nations to catch up with the rich, Western nations (Sachs, 1999). The solution that this discourse offers is more of the same growth that created the gap

between developed and underdeveloped in the first place, through the same means as those that are needed for growth: continuous production of commodities, and commodification of what was previously public goods, for ”developing” nations as junior partners in global partnerships. Historical evidence shows that the development discourse was devised as an alternative to entice poor nations away from the promises of communism during the cold war (Sachs, 1999). To achieve this, development promised to create modern economies, and jobs, and make the amenities of modernity – such as electricity and motor cars – available to the whole world. There are a number of fallacies involved here. First, for everybody in the world to enjoy the standard of living of say, the USA, would require the resources of five planets (Sachs *et al*, 2002). The goal is therefore clearly impossible, making the discourse intrinsically misleading. Second, the nature of capital accumulation is that the gap between rich and poor grows, rather than diminishes, as a result of “growth and development”. The poor do not catch up with the rich in this system, they grow poorer. Nevertheless, the discursive techniques of growth and development continue to mesmerise not only capitalists and governments, but also voters and trade unionists – including those who as workers and neighbours of polluting factories, suffer the consequences of “growth”. It results in a “growth coalition”, in which state actors, business, trade unions, the media and the general public agree that growth is desirable and consent to strategies to enable and support growth (Schnaiberg, 1980). In South Africa, this growth coalition includes the trade unions, whose members’ jobs rely on the formal economy.

Growth is in fact not essential to all citizens, though it is essential to capital, and the tax-dependent state that serves capital. As Offe put it: “… the capitalist state … is oriented towards putting private actors in a position to increase their efficiency and effectiveness according to the criteria of private exchange and accumulation.” (1984: 137). Constant movement and expansion are essential to capital. Money must be turned into commodities which must in turn become money, as fast as possible, on an ever expanding scale. New “opportunities” for this process are constantly sought, for example in privatisation of previously public services (Bakan, 2004; Kovel, 2002; Bond, 2000).

Limited liability

The tactical equivalent of the growth discourse, on the level of the individual firm, is the legal fiction of limited liability. ISCOR's strategy of limiting its liability for its pollution, pre-eminently through legal defence, is not exceptional in the corporate world. The notion of limited liability is a legal fiction – namely that the corporation is a person apart from the actual people constituting it – and is built into corporate structure. In his popular work *The Corporation* Bakan (2004) argues that

> "The corporation's unique structure is largely to blame for the fact that illegalities are endemic in the corporate world. By design, the corporate form legally protects the human beings who own and run corporations from legal liability, leaving the corporation, a 'person', with a psychopathic contempt for legal constraints, the main target of criminal prosecution. Shareholders cannot be held liable for the crimes committed by corporations because of limited liability, the sole purpose of which is to shield them from legal responsibility for corporations' actions. Directors are traditionally protected by the fact that they have no direct involvement with decisions that may lead to a corporation's committing a crime. Executives are protected by the law's unwillingness to find them liable for their companies' illegal actions unless they can be proven to have been 'directing minds' behind those actions. Such proof is difficult if not impossible to produce in most cases, because corporate decisions normally result from numerous and diffuse individuals' inputs, and because courts tend to attribute conduct to the corporate 'person' rather than to the actual people who run the organisations." (2004: 79).

The modern corporation cannot restrain itself from imposing externality costs on others:

> "The corporation's institutional make-up, its compulsion to serve its own financial interests above everything else, requires executives to make only those decisions that create greater benefits than costs for their corporations. Executives have no authority to consider what harmful effects a decision might have on other people… or upon the natural environment, unless those effects may have negative consequences for the corporation itself." (Bakan, 2004: 64).

> "As a psychopathic creature, the corporation can neither recognize nor act upon moral reasons to refrain from harming others. Nothing in its legal makeup limits what it can do to others in pursuit of its selfish ends, and it is compelled to cause harm when the benefits of doing so outweigh the costs. Only pragmatic concern for its own interests and the laws of the land constrain the corporation's predatory instincts, and often that is not enough to stop it from destroying lives, damaging communities and endangering the planet as a whole." (2004: 60)

There are many precedents internationally of persistent denial of the reality of pollution and responsibility for the consequences by corporates (Doyle, 2004; Markovitz and Rosen, 2004; Hallowes and Butler, 2002a; Punch, 1996; Szasz 1994; Brown and Mikkelsen, 1992; Levine, 1982). Limited liability for corporations was historically established, by the state via legal process, to protect shareholders so that large amounts of capital could be brought together – most famously for railway development in the US but much earlier in Europe, linked to seaborne trade even before empire. The history of modern South Africa is closely bound up with that of the world's first multinational, the Dutch East India Company, (Robbins, 2006).

The legal fiction of the corporation as a legal individual able to act separately from its real life shareholders, managers and workers, has had a rocky history (Bakan, 2004), but today corporations appear as solid, overwhelmingly powerful institutions. Their history of depending on state fiat and – potentially - democratic control over their charters of incorporation is not often recognised. However, considering how corporations come into being, and what their social effects are, constitutes in itself an argument for much closer and far reaching regulation of corporations. The objective of the regulation would be that, if corporations should exist at all in future, their managers and other employees should be placed in a position where they can and do internalise environmental and social costs, and are constrained to act within the polluter pays and precautionary principles.

Implications for EJ tactics

The description in this chapter of a pollution complex outlines the challenges for Environmental Justice activists. The pollution dispositive legitimates the externalisation of pollution costs onto fenceline communities through an array of discursive strategies. Yet these strategies are all underlain by a common tactic: to exclude the polluted community and their allies from decision making about the pollution. This happens through framing of questions, the use of expertise to exclude people from debates, control over pollution information, its production and circulation and other tactics. In turn, these tactics rely on an enclosure of material, financial and discursive resources, which result in very unequal discursive power. Another valuable insight is that activists and active resistance do change the shape and functioning of the pollution dispositive – because they are inextricably part of it and its logic.

From the history above it can be argued that, as the progression of organisation from SVCC to VEJA and then the Global Action on Arcelor Mittal shows, the pollution and the subsequent contestation over its existence and its consequences, did provoke and strengthen a resistance against it. While the polluter's offensive strategy did create the conditions for resistance, the organisation and the creation of political power is a result of choice, and application. It is not automatic and it is constantly faced with the options of despair and reformist co-option (Harvey, 1996). It is up to strategic and tactical leadership, analysis and framing to keep these clearly in mind.

This case study shows that the conditions of fenceline communities and the nature of discursive struggles around them do create a tactical terrain which can be used to advance the cause of Environmental Justice. The starting points for this struggle can be framed by *reversing the mechanisms of the imposition of environmental injustice*. That means fighting for *inclusion in decision making, not exclusion*, for the *internalisation of costs, not their externalisation* and *expanding the commons rather than allowing its enclosure*.

Pena argues that there should not be a sharp division between defensive struggles (against pollution, for example) and struggles oriented to "sustainable autonomy", that is "struggles for the sustenance of right livelihoods through self-governance of environmental management in local places" (2005: 150), although he correctly points out that defensive struggles on their own (without moving from these struggles to envisioning and enacting alternatives) are ultimately self-limiting. In practice, fenceline communities make major efforts to achieve better regulation. It is fundamentally important because, even in a piecemeal manner, it can improve fenceline communities' immediate living conditions, and it can serve two further important purposes. First, it can force polluters to internalize the costs they now impose on fenceline communities, according to the principle of "the polluter pays". That can stop or reduce the ongoing transfer of value from communities, who are burdened with health, income and other costs, while the polluter saves money on pollution control. Secondly, it can extend the power that the state exercises in favour of citizens (Szasz, 1994), on the understanding of the state as responsive to both legitimation and accumulation pressures (Jessop, 1990; Yudelman, 1984).

Achieving inclusion in decision making is crucial, but predictably not easy as it touches on the basic distribution of power in our modern, democratic societies. Some decision making structures are in principle open and inclusive (for example parliaments), while others, like investment, production and technology decisions, remain expressly under the jurisdiction of a small elite (Beck 1992: Offe, 1984). Despite these limitations, a dynamic view of the state as a contested site keeps open the possibility of people's inclusion in decision making, or at the very least, helping citizens move to a more critical view of the politics of hegemony.

Expanding the commons presents a fundamental challenge to the politics of enclosing resources and turning them over to stockholders, to be used for generating profit. Activists campaigning for the right to water have largely succeeded in turning around the privatization of water. In South Africa, water was turned into a commons, held in public trust by the state, in 1998, through the National Water Act. The air we breathe is a

commons. Daunting as these challenges may be, engaging in struggles against pollution and supporting fenceline communities who have no choice but to engage in these struggles, is a logical starting point.

Questioning the authority of science in practice

It was argued above that access to scientific knowledge and authority is crucial in pollution battles. Pollution as a policy area has a large technical knowledge component, not only for affected communities (Brown and Mikkelsen, 1992; Levine, 1982) but also for governments (Weale, 1992) and industry (Sampson, 2001). Because it relies on the deployment of knowledge – and disciplines of knowledge – it is open to discursive play of expertise, as argued above. This includes the disciplining in a bureaucracy for experts who "cross the line" and join forces with the community (Levine, 1982). Both Van Eeden and Bosman, quoted in this study, have had to leave their original places of employ. These collaborations between scientists and the community also have their own challenges (Clark *et al*, 2005).

But in this game, experts do not hold all the cards, as Weale (1992: 7) points out:

> "Of course people can feel the ill effects of pollution without knowing the atmospheric chemistry of fossil fuel burning or the biological processes that lead to the accumulation of heavy metals in the food chain, and experts who have denied the possibility of human health effects or environmental damage from particular sources have often had to eat their words…"

Communities under attack from pollution and disbelieving official reassurances that "nothing is wrong", are able to gather their own information and develop their own understanding, sometimes in collaboration with sympathetic experts that join their side (Levine, 1982). It is interesting to see the conclusions they come to, for example Love Canal resident Marie Pozniak: "Gee! It's the miracle of Love Canal! You're on top of a

couple of hundred chemicals for 25 years and nothing's wrong! You just think something's wrong! They should really send all the world's wastes here, because it's the only place on earth such a miracle could happen" (quoted in Levine, 1982: 168). This heavy sarcasm illustrates the loss of faith in authorities that often occurs in pollution situations – especially where industry and the state deny that the pollution exists.

Communities are able to create their own understanding, and the discursive resources to challenge their polluters. The Steel Valley experience showed that *the media and public opinion responded well to first-hand accounts of pollution survivors* – whether these accounts were "scientific" or not. Where these accounts were combined with scientific authority – for example in the form of a whistle blower who was an environmental manager inside ISCOR – these accounts gained strength. Alliances between professional scientists and fenceline communities result in the development of "citizen science" – which brings together citizens' agendas, the use of scientific methods and scientific understanding by citizens groups and the sharing of expertise of professional scientists to forge potentially powerful democratising discursive resources in risk societies (Jasanoff, 2003; Irwin, 1995).

Tactical implications of ecological modernisation

For the Environmental Justice movement it is important to look at the tactical implications of the ambivalence of ecological modernization. Ecological modernization is internally contested. It does pay "serious attention to environmental-ecological issues and most particularly to the accumulation of scientific evidence of environmental impacts on human populations" (Harvey, 1999: 170) which has the potential to discipline capital accumulation to some extent. In mainstream terms, this potential discipline can be seen in European work on the precautionary approach (Harremoes *et al*, 2001).

Because ecological modernisation is a compromise, it represents a shift in position of the elite to absorb the activism of emerging groups and networks. The dynamic shift results in an amalgam of positions and approaches in ecological modernization, so that it is not a

single position. Ecological modernization partly emerges as a response to environmental pressure groups, which itself is the result of better communication and knowledge exchange – e.g. the internet – which strengthens public activism and networking, partly because of scientific knowledge, and partly from recognition of unavoidable material challenges. In order to deal with legitimacy challenges, even social justice pressures are to some extent absorbed, as Harvey puts it:

> "There are also signs of a discursive shift, perhaps fashioned as a response to the contentiousness of the distributive justice issue, in which economic development (improvement in human capacities and conditions) is seen as quite distinctive from economic growth (the increase in output of goods and services). If governments can be persuaded to take the former path then the competitive challenge to the hegemony of the advanced capitalist powers with respect to capital accumulation through economic growth will be lessened" (1999: 167).

This shift has created tactical space for physical improvements, including better pollution control, better and cleaner design of processes – e.g. waste management - and moved debates and practice from a "frontier capitalism" to a more sophisticated and cautious form of capitalism. Also, the public discussion of these issues has opened up, although it remains treacherous terrain with:

> "… much more open and democratic as well as wide-ranging discussions of environmental issues become possible. It is precisely at this interface that the fine line between incorporation and open contestation again and again gets crossed and recrossed, with legal, scientific and economic discourses, institutions and practices becoming a deeply implicated and contested terrain." (Harvey, 1999: 167)

The tactical terrain in a politics of hegemony

The shift to a politics of hegemony in South Africa has created a new terrain for Environmental Justice activists. It has created an array of Environmental Justice rights, from the right to live in a healthy environment in section 24 to the constitution, to procedural rights in terms of the Access to Information Act, the National Environmental Management Act, and freedoms of association and expression. These rights are actualised as they are used, and precedents are set. At the same time, the rights system operates in a contested political economy. Space limitations limit the discussion of all these implications (which could be fruitfully explored in another study). However, it is important for EJ activists to understand the accommodation of conflicting interests in the current ruling bloc, and the influence of that on Environmental Justice struggles. In the final analysis, the externalisation of pollution costs onto fenceline communities is an enforced and unwilling transfer of wealth, in other words a type of theft. This affects different constituencies to varying degrees, and depending on the level of consciousness of the existence and impact of the externalisation of pollution, may lead to constituency pressures on government, as it clearly did on the level of local government in Steel Valley.

Pollution benefits both the shareholders in the production units, as well as the tax-dependent state and its beneficiaries, which is rhetorically expressed in the growth discourse. *The challenge for EJ activists is to show the costs of growth and how they are allocated in our society through analytical work, popular education and mobilisation and in the media while the growth discourse is well-nigh hegemonic.*

A case study of discursive power

This section closes the thesis by checking whether what was promised in the first chapter was achieved, and suggests further topics for research in this area.

Did the case study construct an adequate explanation of the events in Steel Valley between 1994 and 2009? The thesis held that discursive power played a decisive role. This role was analysed in terms of discursive resources, arenas and strategies. It was shown how *a superiority of discursive resources on the side of the polluter, derived from a financial and political superiority, translated into decisive defeats for the Steel Valley community in crucial arenas: both legal and administrative. ISCOR's discursive power overwhelmed the regulator, both in terms of knowledge and rank: the regulator remained too cautious to use to the full the instruments available to it in law, and allowed numerous exemptions. The state and the polluter colluded in pushing issues of Environmental Justice – compensation and rehabilitation – outside the dominant frame of decision making.* The use of material power followed on discursive victories – for example the legal and physical destruction of the Steel Valley community.

Yin (1989) poses further requirements of a case study: to build theory and produce generalizable theoretical propositions and to develop ideas for further study. The study's findings are generalizable to theoretical propositions, and for this purpose it engaged a theoretical terrain in the manner of grounded theory (see Babbie and Mouton, 2001) drawn from disciplines analysing public opinion, the state and polluter behaviour, as well as the developing, theoretically engaged, practice of Environmental Justice activists, within a broader perspective on the nature and use of discursive power and discourse analysis, as laid out in chapter 2 above.

Case studies are expected to build theory, which was achieved here. The study extended Critical Discourse Analysis by blending it with dispositive analysis. It built EJ theory by linking mechanisms of environmental injustice specified in EJ theory, to accumulation and legitimacy processes, and their effects in the public sphere. This was done with the historical details of the Steel Valley pollution, extending back into the emergence of the Minerals Energy Complex and its influence on pollution. It enriched EJ theory building by analysing the processes by which Steel Valley residents were excluded from decision making, had the externalities of pollution imposed on them and finally lost their

community in an act of enclosure by the polluter. The study of tactics for fenceline communities, and extending the concept of fenceline communities, enriched the understanding of participatory democracy.

Yin (1989) requires that a case study should develop ideas for further study. These ideas are laid out below, after a consideration of the broader applicability of the approach developed in this study. The present study is offered as a first overview study of the extensive body of evidence in the Steel Valley case. It carries the intention of opening and defining a field of research, suggesting tools for doing it via discursive analysis. It therefore invites more detailed further studies. Specific studies that would be useful include detailed linguistic Critical Discourse Analysis of texts; possibly using the framework developed in this case study. One fruitful avenue would be to study the Master Plan and the technical negotiations around it as an example of technocratic rule (Fischer, 1990). Media coverage was extensive and could be studied in more detail for understanding how the media responds to Environmental Justice and pollution struggles. Other detailed linguistic CDA studies would also be welcome. The legal aspects of the struggle were not covered in much detail, and a study of these could provide useful insights into the value and conduct of legal tactics of struggle. An interior study of the regulator might be difficult to do in practice, but would shed more light on past and current practices. An overall, more ambitious study of the origins and development of environmental management in South Africa may be undertaken, and could be organised around the role of the MEC as an enclave of extractive industries.

Academic understanding gained through this study

In terms of theory, this case study was situated on an overlap between Critical Discourse Analysis (CDA), originally drawn from linguistics (Janks, 1997) and social constructionism, drawn from sociology (Hannigan, 1995). It is also set in a broader context of political and philosophical work that feeds and inspires CDA: the foundational work of Foucault, Habermas and Gramsci. They draw attention to the functioning of discursive power in society broadly, and its importance. From Habermas specifically this

study drew the idea that all communication, in one way or another, answers to a question about its sincerity, and that the answer to that question is crucial to legitimacy. From Foucault, it drew two central ideas: the one is the truly dynamic and therefore plural nature of power and knowledge in each unique situation, and the idea of the power of the dispositives: that material reality is shaped by discursive power. From Gramsci it drew a general approach to a society wide politics of hegemony.

The insights and approaches from the sociological tradition are useful to identify broad strategies, particularly Thompson's discursive strategies. Hannegarn's work, particularly claims making, provides the basis that social reality is constructed, and that the construction of it is an ongoing contest, an insight that is also fundamental to EJ analysis (Pena, 2005).

Turning to CDA allowed for drawing on the rich and detailed conceptual and practical work in this tradition to describe and understand the discursive contests that make up the case study of Steel Valley. Most CDA analysis focuses on the linguistic characteristics of texts, using a suspicious or symptomatic reading to reveal the strategies and interests at work in the text. But CDA analysts, particularly Fairclough, do acknowledge important areas beyond the text: the conditions of possibility for the text's creation, and how the text circulates (and thus exerts influence) on common sense, public opinion, and decision making. However, these are not usually prioritized for analysis. In this analysis, the latter two areas have been the focus of interest. In this sense, the case study shifted the focus of CDA closer to the political economy and material aspects of the Steel Valley history, and brought CDA and sociological analyses closer together.

In CDA, the consideration of the conditions of possibility includes questions of the creation of discursive resources and the nature of discursive resources. In this case study, discursive resources were clearly important to the outcome of the contestation in Steel Valley; for example, the ability to scientifically describe, confirm or dispute the existence of the pollution. The case study illustrates the challenges of achieving scientific support, while at the same time suggesting tactics for the EJ movement to deal with this issue.

Questions of circulation include questions of accessing and deploying discursive resources. It considers how platforms from which discursive power can be exercised, become available. In this case study, the role of the media, their use of the resources (community narratives) created by fenceline communities is explored, as well as how the media, on this basis, formed public opinion and exerted political pressure. An analysis which relates the question of platforms to that of discursive resources is that of discursive arenas, which were described as platforms with specific rules for the use of discursive power.

The case study drew the analysis of discursive resources, arenas and strategies into a description of a pollution dispositive, a heterogeneous mixture of discourses, knowledges, practices, factories, transformed landscapes and debates about them, which legitimizes the pollution even as it manages it, following on the formulations of Foucault. A dispositive is the outcome of strategic responses to an emerging situation, but it is also an explanation constructed by an analyst. This description allowed the interaction between discursive and material practices to be seen, and provided an explanation of the invisible web of interests, agendas and power structures that denied the Steel Valley residents their environmental rights: making it visible. Whereas the dispositive is used as a framing concept in this study, it would also derive much clarity from detailed archival analysis in the classic Foucaultian method (Foucault, 1982).

The South African state in a period of transition

The nature of the case study placed emphasis on actual historical discursive encounters between antagonists, within an overall question of the legitimacy the new state in South Africa, and its ability and willingness to protect citizens against pollution.

An understanding of the tax-dependent state and its simultaneous commitment to maintaining legitimacy through responding to citizens needs and opinions, and the sometimes more fundamental need to protect the accumulation needs of an elite in the

political economy for its own survival, emerged as an important explanation of the state's initially puzzling behaviour in this case: its failure to guarantee Steel Valley citizens their right to a healthy environment. Equally important is the basic insight that the balance between these two contradictory demands on the state is not a given, but is determined through political struggle.

This analysis enriched our understanding of the transitional period in South Africa, by showing the sectoral effects of a neoliberal approach in tension with the rights in the constitution. It related the insights of this case study to the broader debates in Environmental Justice, e.g. questions of strategies and tactics, engagement with the state, understanding corporate strategies, issues of race and class and other framing choices. It provided an understanding of the South African state as an industrial state in a double risk society.

The pollution dispositive also draws on internationally available discursive resources to maintain itself. The analysis identified three powerful hegemonic discourses: that of science and its play of certainty and uncertainty combined with a powerful authority to pronounce on the reality of pollution, that of legitimacy in the national interest, and that of growth and development, mesmerizing in its promises to corporates, governments and citizens. Environmental management is a practice relying on natural science but also drawing in other knowledges to place the management of environmental problems in the hands of elites: those responsible for these problems in the first place. The analysis of the dispositive shows how environmental management is also, like the state, a terrain of struggle rather than a neutral given.

The Minerals Energy Complex and Environmental Justice

The understanding of the Minerals Energy Complex was extended through this study, to include a view of it as a pollution producing machine, which developed into a pollution dispositive in Steel Valley as it was challenged to legitimate its pollution. This is a contribution to the general understanding of the political economy of South Africa.

The study has developed further, as its intention was, the analysis of the mechanisms of imposing environmental injustice, and drawn them into an analysis of discursive power. It has particularly revealed the tactics of excluding communities from decision making about their polluted environments, via the politics of knowledge, focusing on the tactic of creating paralyzing uncertainty and monopolizing and controlling knowledge. What does this perspective mean for future Environmental Justice contests? The Steel Valley case study shows that environmental rights in the new SA are hollow. It is difficult to translate the rhetoric or the rights in the constitution into real protection for people and ecosystems on the ground. In particular, the responsibility for pollution legacies is not carried by the polluters. This is important since there are large toxic legacies in SA.

It is proposed that other studies of the environmental aspects of the MEC could yield fruitful results. The discursive patterns in contests around pollution identified in this case study, can be argued to also apply to other instances of pollution in South Africa, for example the pollution of the Far West Rand dolomitic aquifers by gold and uranium mining, the short term mining of coal in the Mpumalanga Lakes District, platinum mining in Sekhukhune, fuel and chemicals in Sasolburg, heavy industry in Richards Bay, petrol refineries in South Durban and manganese processing in the Vaal Triangle. It is interesting to note that most cases of pollution relate to the central accumulation project in South Africa, that of the Minerals and Energy Complex (Fine and Rustomjee 1996).

The whole Vaal Triangle, as was alluded to briefly in the exploration of VEJA's history, is riddled with industrial pollution. Further studies of its extent, impacts and more empowered citizens' and Environmental Justice responses to it are necessary. In particular, VEJA deserves a study on its own where its responses to a region wide mosaic of pollution challenges could be better understood. A comparative study with the experiences of the South Durban Citizens Environmental Alliance (SDCEA) may yield useful insights into how to strengthen such activism. In this vein, other areas of concentrated chemical pollution and the reaction of fenceline communities include not only South Durban, but also Sasolburg, Witbank, Secunda and Pietermaritzburg. Similar

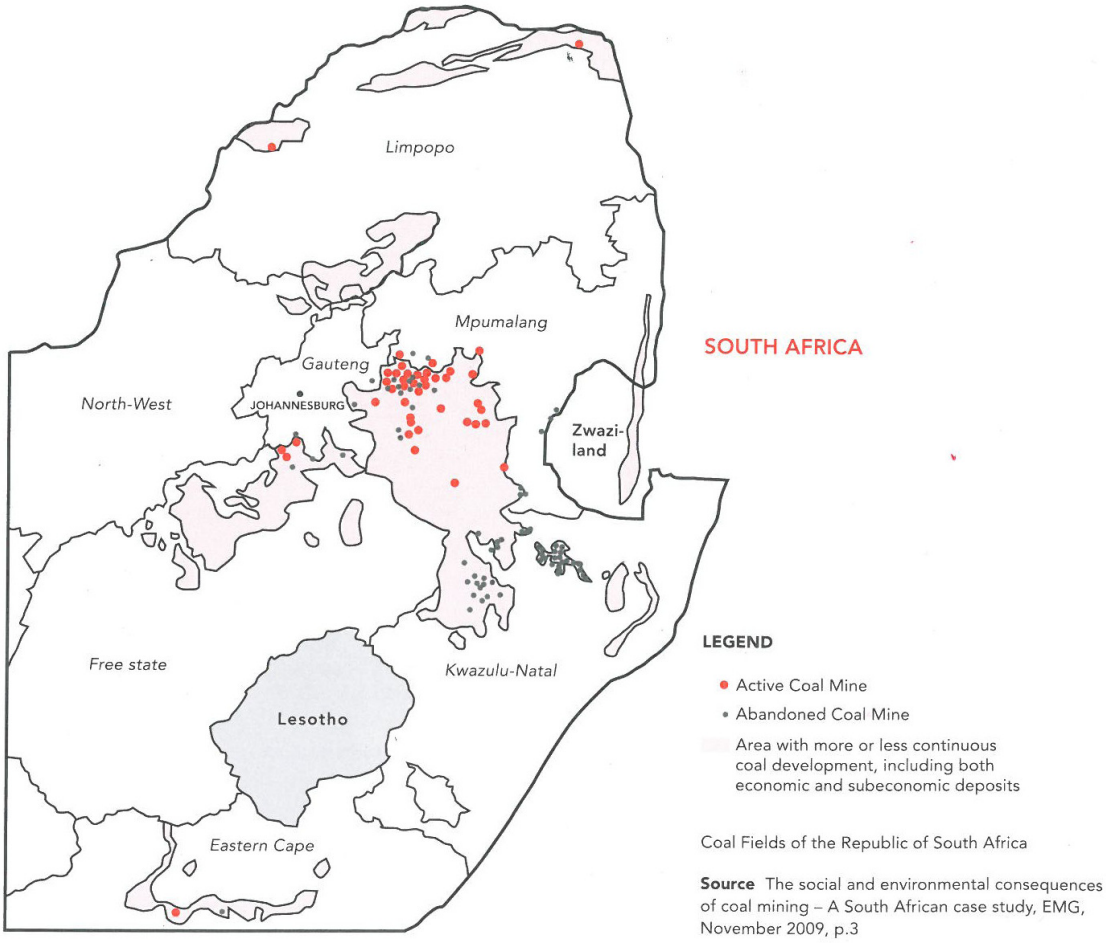

Fig 10.1 Coalfields of South Africa. With permission from Environmental Monitoring Group.

studies should be undertaken for the Waterberg coalfield, which is at the start of a massive exploitation of its resources in mining, power generation and chemicals production (Munnik, 2009). The coal mining areas of Mpumalanga equally deserve analysis based in a framework of Environmental Justice, as open cast mines put their neighbours, agriculture in the area and the water resources of the Upper Vaal and other catchments at risk (McCarthy, 2011; Munnik, 2009).

An issue receiving current attention is the acid mine drainage along the Gold Belt from the East to the West of the Reef (Coetzee *et al*, 2010; Winde, 2010). This legacy includes the issues of toxic mine dumps and radio-active contamination, including of water sources. Many of these issues echo the challenges encountered in Steel Valley, such as the strategies of polluters and the responses of the regulator and fenceline communities.

It is urgent to undertake research that shows the costs of these extensive externalities to fenceline communities, the nation and ecosystems. These costs are not taken into account as a new round of expansions to the MEC is planned, in South Africa and outside (Munnik, 2007). Accumulation, under the shield of the growth discourse, remains the dominant ideological framework, to the extent that it is sometimes not even questioned by those hurt by it. However, popular opinion is becoming more aware of and sympathetic to environmental issues. Using this power, the challenge is to challenge the accumulation bias of the state. This means to question, unpack and unmask the growth (and development) discourse as a misleading rhetorical strategy.

More broadly, challenging the growth discourse is to challenge capitalism, commodification, the profit motive, and their one-dimensional calculations that lead to degradation of environments and people who live in them. Legitimacy struggles must include imagining alternative ways of dealing with production, people and the environment. These are all lessons for the EJ movement, and my hope is that this case study will contribute to a discussion and active use of discursive power.

Resisting closure

Finally, this work is a contribution to an ongoing project of using intellectual means to resist reification by engaging with the future through understanding the past. In the words of Michel Foucault:

"... I would say also, about the work of the intellectual, that it is fruitful in a certain way to describe that-which-is by making it appear as something that might not be, or that it might not be as it is… recourse to history … is meaningful to the extent that history serves to show how that-which-is has not always been, i.e. that the things which seem most evident to us are always formed in the confluence of encounters and chances, during the course of a precarious and fragile history. … It means that they reside on a base of human practice and human history; and that since these things have been made, they can be unmade, as long as we know how they were made "(Foucault, 1990: 36).

APPENDIX 1: Detailed analysis of discursive encounters

This appendix presents the full analysis of the 31 discursive events discussed in chapter 3. First an overview is presented, and then each event is analysed according to 10 predetermined criteria.

1.1 Overview of 31 discursive events

Event or encounter	Nature of discursive encounter(s)
Phase 1: challenging pollution (1994 to 2000)	**In this first phase, from 1994 (the arrival of the new SA) to the start of the buy-out in 2000, the first opening up of the public sphere, new rules for discursive encounters. This new framework for discursive contestation is used by protagonists.**
1. DWAF challenges ISCOR	New constitution empowers officials, DWAF takes up residents' complaints, Carin Bosman correspondence; DWAF decides confrontation in court is not worth it (officials' informal communication - it's a risk for officials to use law, the legal costs as well as cleaning up and then sending a bill)
2. Steel Valley residents consolidate in new local government	New democratic local government, alliance across racial lines, to challenge polluter. Local political mechanism for redressing pollution issue from 1996
3. ISCOR and local government pollution forum	Platform for ongoing discussions between polluter and residents organised (demanded) by local government, access to archives' information
4. Nolte report	Consultant to ISCOR from Council for Scientific and Industrial Research (CSIR) gives certainty about the pollution.
5. DWAF forum (not the same as the first forum constituted by local government)	Constituted by DWAF after local government forum failed.
6. DWAF archive goes public	As part of forum proceedings. These are the reports that Carin Bosman read, that prof Philip Lloyd analysed, that Johnny Horne group took into their court case and that the 16 applicants put before the court. Additions during preparation for appeal after 2003.
7. Cost-benefit analysis	Main product of the DWAF forum was a cost benefit analysis between buy-out and remediation options, favouring buy-out.
8. ISCOR buy-out proposal	Proposal before the cost benefit analysis was completed, thus anticipating its outcome. Basis for later buy-out.
9. Calculations for buy-out	Document in which one resident wrote down his considerations about the buy-out. It reveals the impact of the buy-out proposals.

10. Johnny Horne court case	Court case by residents because of frustration with forum.
11. DWAF dealing with outcomes of forum	Correspondence between DWAF and ISCOR when DWAF was called upon by Steel Valley residents to manage outcomes and outfall of forum, and make its decisions binding, but failed to do so
12. Unilateral ISCOR buy-out	ISCOR initiates single buyer buy-out of Steel Valley farms. It demarcates its own buy-out zone, at its own prices calculated through its own process.
13. ISCOR's Water Use license (Exemption 1998B)	Contains a phased approach for management of ISCOR pollution.
Phase 2: Refusing Closure (2000 to present)	**This phase takes place in the aftermath of the buy-out and physical destruction of (most of) Steel Valley. It is characterised by people's memory, organisation locally, regionally, nationally and internationally, and ongoing pressure on ISCOR - now Arcelor-Mittal. Mittal pushes for closure with help from the state.**
14. The Master Plan	8000 pages of information on pollution and remediation strategies, kept secret with agreement of the regulator.
15. Court case of 16 applicants	16 applicants decided to repeat the success of the Johnny Horne court case, used same and similar evidence, expected same results.
16. Scientist whistle blower	ISCOR employee provides information to residents for court case.
17. DWAF moves to closure under media spotlight	Media spotlight occasioned by 16 applicants' court case. DWAF legitimates ISCOR's behaviour as it legitimates itself under pressure of media attention.
18. Hatch Report	Due diligence report in which IDC (part ISCOR owner) presents position of closure on pollution battle in order to sell ISCOR.
19. Gagging order and SVCC	ISCOR imposes gagging order on 16 applicants which leads to formation of Steel Valley Crisis Committee to speak on their behalf.
20. WSSD and toxic tour	During WSSD, Steel Valley issue emerges on national and international civil society corporate accountability agenda. Media and international dignitaries are taken on toxic tour including ISCOR works.
21. 2003 water licence application	Licence contains formal procedure of public participation and comment, reveals community attitudes.
22. leaked centralisation memo	Memo leaked by whistle blower showing information control in Master Plan process.
23. Friends of Steel Valley	Formation of support organisation for SVCC, brings in expertise on basis of solidarity
24. VEJA founded	Brings together organisations in the Vaal Triangle fighting pollution.
25. Constitutional court challenge	Individual challenge by Johann de Kock, ex-resident of Steel Valley.
26.2006 water use licence	Stronger regulation of ISCOR's water use through license conditions.
27. Mittal R1 billion green budget	Mittal planning for refurbishment, involves a series of EIAs, for slagheap, coke plant, iron reduction plant etc.

28.Opening water treatment plant	This event reframes Mittal's public profile on pollution responsibility. The treatment plant is physical evidence of a new attitude. The brochure produced for opening undertakes the reframing in discursive terms.
29. Day of Remembrance	Organised by VEJA to publicly defend last remaining inhabitants of Steel Valley against pressure from Mittal to move out.
30. Global Action on Arcelor Mittal	VEJA and therefore Steel Valley become part of an international network observing and critiquing Mittal plants.
31. Arcelor Mittal meets VEJA	A series of meetings between ArcelorMittal and VEJA.

1.2 Discursive events analysis (events 1 to 3)

Event or encounter	**1. DWAF challenges ISCOR**	**2. Steel Valley residents consolidate in new local government**	**3. ISCOR and local government pollution forum**
Nature of discursive encounter(s)	New constitution empowers officials, DWAF takes up residents' complaints, Carin Bosman correspondence; DWAF decides confrontation in court is not worth it (ex-officials informal explanation: it's a risk for officials to use law, the legal costs as well as cleaning up and then sending a bill)\	New democratic local government, alliance across racial lines, to challenge polluter. Political mechanism for redressing pollution issue from 1996	Platform for ongoing discussions between polluter and residents organised (demanded) by local government
Discursive resources	New constitution legitimates discourse of Environmental Justice, human rights, accountability, equality, polluter pays principle, environmental sustainability and responsibility	Local government has discursive authority as political representative, has laboratories, planning staff, can give planning permission	Local government resources, platform with authority and legitimacy embraced by citizens and attended by polluter
Arena and its rules	Official action within job description, bureaucratic hierarchy has discretion, polluter has right to reply and can put pressure on regulator. i.e. through lawyers: administrative action, water use permits, exceedances, pollution incidents,	Political arena - gives voice to constituents, but must compete nationally with other government priorities - jobs, tax income, economic management	Discussion of evidence, representative, new, untested power of democratic local government

	regulation. Interaction with public complainants and sometimes media		
Strategy and tactics	Cautious regulator, field officials more active than their superiors; polluter continues in tradition of surplus power (rights beyond the law)	Uses political networks, uses own resources, public meetings, engages in forums, develops Mooi Waters Vision, to challenge polluter	ISCOR did not see the forum as binding, forum was replaced by DWAF initiated forum, thus local government authority undermined
Existence of pollution	DWAF official Bosman reads ISCOR archive which contains clear evidence of pollution	Actively seeking evidence of pollution - discusses in DWAF forum. Evidence from residents collected in cost-benefit analysis	DWAF's archive on ISCOR was made available through this forum: consultants reports to ISCOR containing evidence of pollution
Consequences of pollution	Regulator ambivalent about using powers because 1. ISCOR strategic role 2. difficulties of taking action against ISCOR	Actively pursuing compensation, buy-out, medical fund	Sharp disagreement about nature of and responsibility for pollution, ISCOR withdraws into legalistic mode
Material power	ISCOR has huge financial resources to drag out legal battles and win them; ISCOR produces strategic inputs into economy; ISCOR provides many jobs	Provides platforms for citizens to express themselves, plan together etc. material resources including laboratories	ISCOR has huge financial resources, legal team, but forum succeeds in opening discussion and presenting evidence convincing media and public
Comments	ISCOR first seen as alien, Afrikaner ruled entity, but BEE and black appointments change complexion,	Limited as a relatively low political level that can be overruled or ignored by others (e.g. wanted state of emergency declaration, but was denied)	Local government acting on citizens voters) mandate, was shown to be not strong enough to confront ISCOR
Date	1994 to 1996	1996 to 2000	1997
Where discussed	Chapter 7 - role of the state	Mostly chapter 6, responses in 7, 8 and 9	Chapter 6 and 8

1.3 Discursive events analysis (events 4 to 5)

Event or encounter	**4. Nolte report**	**5. DWAF forum (not the same as the first forum constituted by local government)**
Nature of discursive encounter(s)	Consultant to ISCOR from Council for Scientific and Industrial Research (CSIR) gives certainty about the pollution.	Constituted by DWAF after local government forum failed

Discursive resources	Scientific evidence of the pollution, and authoritative conclusion that pollution was real	The state has authority to order a forum into existence, and force participation by polluter and polluted
Arena and its rules	Scientific authority in scientific research report	Polluter and polluted engaged in a framework constituted by national government (DWAF)
Strategy and tactics	Report formed basis of DWAF instruction to start second (DWAF) forum: ISCOR to pay for forum	A cost benefit analysis was undertaken - a framework for decision making about the future of Steel Valley
Existence of pollution	Scientific evidence of the pollution, and authoritative conclusion that pollution was real	Achieved significant information sharing – but uncertainty about pollution created in cost-benefit analysis
Consequences of pollution	Clear implication about responsibility, but no conclusions on that. It served as an input into other processes	State declared that pollution was real issue and had to be dealt with
Material power	Trained scientist and access to evidence without restriction on content or circulation	State enforced deliberative decision making about future of Steel Valley
Comments	This type of scientific evidence was later restricted by ISCOR.	The forum was not binding, so it was discursive exercise without the expected good faith consequences. When good faith evaporated, more confrontational not deliberative tactics were followed.
Date	August 1997	1997
Where discussed	Chapter 8	Chapters 7, 8 and 9

1.4 Discursive events analysis (events 6 to 8)

Event or encounter	**6. DWAF archive goes public**	**7. Cost-benefit analysis**	**8. ISCOR buy-out proposal**
Nature of discursive encounter(s)	As part of forum proceedings. These are the reports that Carin Bosman read, that prof Philip Lloyd analysed, that Johnny Horne group took into their court case and that the 16 applicants put before the court	Main product of the DWAF forum was a cost benefit analysis between buy-out and remediation options	Proposal before the cost benefit analysis was completed, thus anticipating its outcome. Basis for later buy-out.
Discursive resources	Compelling evidence of pollution from a number of consultant reports	Multidisciplinary analysis of steel valley situation, including economic analysis and attitudes of residents.	Ability to plan for anticipated outcome and prepare tactical alternative - access to legal discursive power
Arena and its rules	Consultants' reports are usually	Cost benefit analysis was decision making	Ongoing bilateral conversation between

	confidential. These were lodged with DWAF under an expectation of confidentiality, but later made public (after 1994). An important part of regulation is production of credible information on pollution	tool based on information gathering and weighing, also gave authors the power to frame the decision	ISCOR and state well established practice, and not subject to forum scrutiny
Strategy and tactics	ISCOR strategy to withhold information, residents strategy to access and use as much information as possible	A cost benefit analysis comparing two outcomes that have already been defined: buy-out or remediation, making buy-out seem most reasonable option. Small budget and short time span.	ISCOR uses privileged bilateral channels of communication with state
Existence of pollution	Comprehensive historical evidence of pollution	Report is coy about evidence of the existence of pollution. Resources to settle the question were not made available or deployed. The report pushed earlier certainty about the pollution into the background	Proposal made "without prejudice" in legal terms, not admitting to pollution or liability, part of legalistic strategy
Consequences of pollution	Consultants' reports contain warnings that ISCOR was making itself liable to claims for compensation and to state prosecution	Enables decision making on consequences of pollution through knowing the disposition of residents - i.e. do they want remediation or buy-out	Proposal made "without prejudice" in legal terms, not admitting to liability for consequences of pollution
Material power	State has extensive power to make information pollution public	ISCOR paid for the report. Explanations of limitations to the report - importantly on the existence of pollution or not - can be traced back to financial resources available for this work	Large organisation with legal team and planners can anticipate struggles tactically
Comments	The fact that the evidence was now public gave residents, as it turned out, false confidence that their case was now	The buy-out option was discursively established and residents were primed to accept it. However, the terms on which the	Crucial framing for eventual buy-out in 2000

	invincible. It brought the contest to a new frontier beyond the question of scientific truth	buy-out would take place were defined by ISCOR after the report. Note that the reality of the pollution is constantly questioned again even if established earlier. this allows the polluter room to deny liability	
Date	1997 - 2004	1998	1998
Where discussed	Mostly chapters 4, 5 and 6, but also 7,8 9 and 10	Chapters 6, 7 and 8	chapters 7 and 8

1.5 Discursive events analysis (events 9 to 11)

Event or encounter	**9. Calculations for buy-out**	**10. Johnny Horne court case**	**11. DWAF dealing with outcomes of forum**
Nature of discursive encounter(s)	Document in which one resident wrote down his considerations about the buy-out. It reveals the impact of the buy-out proposals	Court case because of frustration with forum – led to success in selling properties and relocating	Correspondence between DWAF and ISCOR when DWAF was called upon by Steel Valley residents to manage outcomes and outfall of forum, and make its decisions binding, but failed to do so
Discursive resources	Intimate knowledge of household economy and strategies allows convincing expression of impact	Used evidence of pollution that came to light during the forum	Authority as the regulator and legitimacy as national government department
Arena and its rules	Diary style: contemplative planning document, sincerity, realism and thoughtfulness.	Legal arena - expensive legal assistance to deal with specialised rules of court case	It seemed state did not believe it had more than moral authority, so to get binding instructions it needed to go to court. Both DWAF and ISCOR seemed to work from this understanding
Strategy and tactics	Handwritten notes: personal document but later shared with other residents, media and researchers	Selected (not inclusive) group of smallholders, settled in own direct interest	State expressed displeasure through letters, but went no further in citizens' defence
Existence of pollution	Deals with consequences of buy-	Used forum evidence	State did not use extensive information

	out, not the pollution		proving pollution at its disposal to force the issue
Consequences of pollution	Illustrates impact of pollution on livelihoods and so illustrates consequences of pollution	Individual buy-outs at high prices for Johnny Horne and his group	State did not intervene in the buy-out although it disagreed, e.g. with the demarcation. It reneged on its political role as arbiter
Material power	Reflects decision making from position of having to accept unwanted framework	Largely privileged white residents	ISCOR succeeds in acting as independent institution that will only be bound on its own terms – revives parastatal privileges
Comments	Shows sincerity and therefore is convincing	Moved early and surprised ISCOR, but settlement out of court therefore not precedent setting	Shows difference between regulator (ecological modernisation) and political champion (abandons citizens to ISCOR/Mittal) roles
Date	1998	December 1998 and 1999	Early 1999
Where discussed	Chapter 7	Chapters 6, 7 and 8	Chapters 6, 7 and 8

Fig 1.6 Discursive events analysis (events 12 to 13)

Event or encounter	**12. Unilateral ISCOR buy-out**	**13. ISCOR's Water Use licence (Exemption 1998B)**
Nature of discursive encounter(s)	ISCOR initiates buy-out of Steel Valley farms. It demarcates its own buy-out zone, at its own prices calculated through its own process	Contains a phased approach for management of ISCOR pollution (ecological modernisation)
Discursive resources	Knows local property market through its property arm, VESCO. Understands dispositions and options of residents it wants to buy out. Built up tactical knowledge through cost-benefit analysis	DWAF exercising its power as regulator through license document - prescriptive text and legally binding, violations can lead to prosecution
Arena and its rules	Strong player in property market. Only buyer. Private deals with residents	Compliance within law, but exemptions negotiated case by case
Strategy and tactics	Controls newsletter about the Steel Valley process and communicates buy-out plans with that authority	Ecological modernisation - creating management and regulatory instruments to deal with future pollution
Existence of pollution	Moves to exclusively occupy landscape that contains evidence	Pollution clearly implied, as detailed in Master Plan

	of pollution and refuse access to that evidence	
Consequences of pollution	Uses remediation of Steel Valley over longer term as explanation for total control over area and access to it	Focus is on future pollution, remediation remains a possibility but not spelled out e.g. in timelines
Material power	Translates discursive victories into landscape change. Positioned as only possible buyer. Physically occupies polluted landscape	Pollution control remains negotiation around ecological modernisation
Comments	ISCOR 's Master Plan (see below) describes this tactic as "institutional solution" to remediation	Ecological modernisation, managing into the future but obscuring the past, ignoring social justice, opening way for reification
Date	From 1999 to 2000 (and then ongoing process as some residents resist)	Granted in September 1999
Where discussed	Chapters 8,9 and 10	Chapters 8,9 and 10

Fig 1.7 Discursive events analysis (events 14 to 16)

Event or encounter	**14. The Master Plan**	**15. Court case of 16 applicants**	**16. Scientist whistle blower**
Nature of discursive encounter(s)	8000 pages on information on pollution and remediation strategies	16 applicants decided to repeat the success of the Johnny Horne court case, used same and similar evidence, expected same results	ISCOR employee provides information to residents for court case
Discursive resources	In-house confidential report, under control of ISCOR, large number of specialist consultants, bound to confidentiality	Access to legal advice through sympathy (solidarity), support from NGOs	Authoritative scientific and managerial evidence from the inside
Arena and its rules	Remained secret through a deal between the state and polluter, as well as participating scientists' confidentiality agreements	Legal arena - expensive legal assistance to deal with specialised rules of court case	New SA legislation allows and protects whistle blowers, if prescribed procedures followed. Some scientific ethics allow for whistleblowing
Strategy and tactics	ISCOR made state complicit through argument about confidentiality, thus depriving citizens of crucial information about pollution.	Residents were outmanoeuvred: ISCOR had learned from first court case, denied all responsibility, disavowed	Solidarity with residents, whistle blower followed prescribed procedures and continues career in water quality and public interest

	Master Plan became an inscrutable excuse for all queries about pollution	consultants' reports	
Existence of pollution	Clear, scientific evidence of pollution – but kept out of circulation	Legal arena allowed evidence to be disputed, i.e. consultants reports were "hearsay"	Clear evidence, not always usable in court or media
Consequences of pollution	Various plans proposed, updating of equipment, water treatment facility, remediation and institutional control	ISCOR able to deny responsibility	Evidence points to ISCOR awareness of liabilities
Material power	Censorship, controlling circulation of information; intimidating the state	Huge financial resources to procure legal talent made this a very unequal contest in the legal arena, e.g. cost of specialist witnesses	Whistle blower had career alternatives and was protected by legal framework
Comments	Exposes central contradiction: voluminous account of pollution and remedies of pollution that ISCOR denies exists or has been caused by itself	Shows definite limit of legal strategies	Shows power of solidarity and "just cause"- scientists joining fenceline communities
Date	Started in 2000, completed in 2003	2001 - 2006	2001
Where discussed	Chapters 8, 9 and 10	Chapters 6 and 8	Chapters 5, 6 and 8

Fig 1.8 Discursive events analysis 17 to 19

Event or encounter	**17. DWAF moves to closure under media spotlight**	**18. Hatch Report**	**19. Gagging order and SVCC**
Nature of discursive encounter(s)	Media spotlight occasioned by 16 applicants' court case, but ongoing since first court case	Due diligence report in which IDC (ISCOR owner) presents position of closure on pollution battle in order to sell ISCOR	ISCOR imposes gagging order on 16 applicants which leads to formation of Steel Valley Crisis Committee (complainants' children) to speak on their behalf
Discursive resources	Court papers and people's own stories ("meaning they had	State and professional authority for closure on question of pollution	ISCOR follows powerful legalistic strategy, but provokes

	made") persuasive to the media – but state has authority to pronounce on reality of the pollution	liabilities	the creation of an important platform for discursive action and social mobilisation
Arena and its rules	Media arena - sincerity, common sense lead to persuasion, media discussion at human level. Strongest arena for the polluted. Government assumed to have authority	High level business report on which transaction decisions are made, difficult to retreat from	In legal arena ISCOR was using its legal power, but in public and mobilisation arena the residents' response created an institutional base for ongoing resistance
Strategy and tactics	Government legitimates itself and in the process has to legitimate ISCOR/Mittal.	Report intended to facilitate sale (reassure Mittal a buyer) but supports closure	Creates organisation that refuses closure and has potential - which it eventually realises - to become part of international solidarity movement
Existence of pollution	Government argues that pollution has been dealt with – which implies that pollution was real	Not clear, report not seen, but presumably minimizes pollution	Gagging order creates suspicion that there is pollution evidence
Consequences of pollution	Government presents position that consequences have been dealt with.	All consequences of pollution have been dealt with	Gagging order creates suspicion that Steel Valley residents have a case
Material power	Media interest, on value level and commercial level, is in sensational stories of injustice, which Steel Valley provides. But government has massive authority.	Basis of commercial transaction, thus embedded in financial flows unlikely to be reversed, but nevertheless vulnerable to media questioning	Overwhelming legal power of ISCOR
Comments	Shows that legal arena action activates media interest and forces discussion and position taking. However, state is tactically forced to assist ISCOR in closure strategy	Report commissioned by IDC after panic about Saldanha works and need to sell	Counterproductive strategy and basis of argument that repression provokes resistance by providing a clear rallying point
Date	Throughout into 2011	2001	2001 to 2002
Where discussed	Chapters 6, 7, 8, 9 and 10	Chapter 8	Chapter 9

1.9 Discursive events analysis (events 20 to 22)

Event or encounter	20. WSSD and toxic tour	21. 2003 water licence application	22. Leaked "information centralisation" memo
Nature of discursive encounter(s)	During WSSD, Steel Valley issue emerges on national and international civil society corporate accountability agenda. Media and international dignitaries are taken on a "toxic tour" including ISCOR works	Licence contains formal procedure of public participation and comment – also information on requirements e.g. effluent standards	Memo leaked by whistle-blower and published in media, showing information control in Master Plan process. DWAF then questioned "censorship"
Discursive resources	Ability to show Steel Valley to visitors, to host visitors (international solidarity) to talk about experiences and loss (community meaning making)	Residents' and stakeholders' knowledge of pollution and local history	Management memo showing nature of process: control over scientific personnel and their knowledge, revealing an attempt to keep that knowledge confidential
Arena and its rules	Arena of public opinion changed during WSSD with emphasis on environmental sustainability, thousands of environmental activists in the country and media attention on the topic	Public participation – information needs to be provided and discussed	Management instructions can control information, but are vulnerable as they reveal strategies. Whistleblowing came from inside polluter's offices
Strategy and tactics	National and international civil society networks support SVCC. Global solidarity and boomerang effect (repressed issue returns at higher level)	Residents engaged with licensing application in order to gain a platform for their opinions, as well as proposed conditions for water use. Could not stop granting of license	Putting management decisions into public arena affecting polluter's profile. ISCOR's response was harsh towards government who questioned "secrecy"
Existence of pollution	Pollution glaringly obvious to visitors	Clearly implied by this process	Creates suspicion that ISCOR is hiding information
Consequences of pollution	ISCOR 's denial of responsibility becomes an item on international corporate	Stricter standards of regulation for ISCOR future production impacts	Creates suspicion that ISCOR is trying to escape consequences of pollution

	accountability agenda - where it eventually attracts international solidarity		
Material power	International event created a platform which was unusual although ISCOR could have foreseen this - possibly underestimated the global activists and consequences of WSSD	State power in controlling access to water. ISCOR needs license and water is crucial input. An arena in which participation can make a physical difference	Whistle blower defies employer's control over information, and journalist publishes memo. This alerts DWAF to possible censorship.
Comments	Illustrates boomerang effect (repressed local issue returns at higher level) and spinoff of creating international platform in South Africa	These occasions for participation are often underestimated by activists because of the relatively small gains they produce, but they have informational and public opinion effects which can be valuable	The basis of whistleblowing is solidarity or just cause
Date	2002, included preparations before	2003	2003
Where discussed	Chapters 6 and 9	Chapter 7	Chapter 8

1.10 Discursive events analysis (events 23 to 25)

Event or encounter	**23. Friends of Steel Valley**	**24. VEJA founded**	**25. Constitutional court challenge**
Nature of discursive encounter(s)	Formation of support organisation for SVCC	Brings together organisations in the Vaal Triangle fighting pollution	Individual challenge by Johann de Kock, ex-resident of Steel Valley.
Discursive resources	Brings research, organisational, networking resources to SVCC	Draws together and brings into the pollution arena previously created political discursive resources, in explicit Environmental Justice framework	Legal challenge based on section 24 of constitution: right to an environment not detrimental to health and wellbeing. Based on personal experience and own research. Follows on years of writing letters to public figures
Arena and its rules	Civil society solidarity on the basis of shared values and strategies	Organise within local political tradition – community political structures, annual general meeting for mandates, inclusive steering committee	Practical problems with securing adequate legal representation - knowledge base of case is overwhelming in volume

Strategy and tactics	Brings Environmental Justice strategies and tactics to Steel Valley situation, first to support 16 applicants court case, but later to support VEJA	To unite opposition to pollution, to create solidarity power to face polluters together. Main strategy is to refuse reification and continue fight against pollution and its consequences.	Use constitutional court to challenge for a constitutional right
Existence of pollution	Brings deeper insight into pollution by drawing on more analytical resources: understanding of pollution discourse and processes to residents and activists	Convinced of existence of pollution through personal experience, e.g. living in Steel Valley, and next to SASOL in Sasolburg	Takes pollution as self-evident and adequately proved
Consequences of pollution	Prepares the ground for broader mobilisation	Views consequences through an explicit Environmental Justice framework, i.e. that pollution constitutes a transfer of wealth from poor to rich.	Action assumes that pollution infringed on constitutional rights, and civil and criminal consequences for polluter as well as regulator are required
Material power	Expert time, international networks, fundraising ability	Able to create a platform and meeting point for anti-pollution activists through an organisation, office, meetings, networks etc.	No financial resources to obtain adequate legal representation. "Legal and donor fatigue" on this issue.
Comments	Result of solidarity	Environmental Justice solidarity is a powerful and dynamic resource, and can build on pre-existing discursive resources, e.g. political organisation.	Illustrates that individual citizen cannot enforce constitutional rights without significant financial resources.
Date	2003 onwards	2004	2005
Where discussed	Chapter 9	Chapter 9	Chapters 6 and 9

1.11 Discursive events analysis (events 26 to 28)

Event or encounter	**26.2006 water use licence**	**27. Mittal R1 billion green budget**	**28.Opening water treatment plant**
Nature of discursive encounter(s)	Stronger regulation of ISCOR's water use through license preconditions	Mittal planning for refurbishment, involves a series of EIAs, for slagheap,	This event reframes Mittal's public profile on pollution responsibility. The

		coke plant, iron reduction plant etc.	treatment plant is physical evidence of a new attitude. The brochure produced for opening undertakes the reframing in discursive terms.
Discursive resources	Knowledge and regulatory power combine to exert pressure for ecological modernisation	Ability to spend money (plan, budget) for new equipment, and present these as environmental improvements	Public Relations department able to reframe the issue in the brochure. Strategic importance of Mittal - able to invite deputy minister as a speaker
Arena and its rules	Regulatory power is a negotiation between regulator and polluter. New legislation opens the possibility for the public to know the content of the water sue license, and comment on it	Corporate planning and public relations - corporate planning is in realm of production choices and cleaner production, public relations is monologic communication aimed at producing acclaim	Public opinion and public relations. Orchestrated media event, press will report on it prominently, even critics and opponents are invited
Strategy and tactics	Ecological modernisation. The regulator also learns from history and responds to public pressure.	Present an image of environmental responsibility and cleaning up	Powerful display of Mittal's new good intentions. The whole event is under Mittal's control, on Mittal ground and sends the messages crafted by the company
Existence of pollution	Implies that the pollution existed and is an ongoing possibility. It sets standards within which pollution is allowed and is legal.	Implies that old plant was polluting if new plant is less polluting, but this aspect is in the background only	Implies existence of past pollution
Consequences of pollution	Pollution is administered within certain bounds. It is not clear that serious consequences follow on the breach of the regulations	Silent on consequences of pollution - although implies that Mittal is "cleaning up its act"	Silent on pollution that already occurred (company could have announced remediation measures but did not)
Material power	Power to inspect, in theory to cut off water supply which is unlikely in practice	Financial means to replace and upgrade equipment, and platform (media, internal staff) for public relations communication	This public relations exercise is enabled by Mittal financial resources and strategic position in country
Comments	The regulator seems more serious about	Illustrates that a process of ecological	Material sign of Mittal's new

	regulating future pollution - possibly as a result of its experiences.	modernisation is at work	environmental care
Date	2006	From 2003 and ongoing	2006
Where discussed	Chapter 7	Chapter 9	Chapter 9

1.12 Discursive events analysis (events 29 to 31)

Event or encounter	**29. Day of Remembrance**	**30. Global Action on Arcelor Mittal**	**31. Arcelor Mittal meets VEJA**
Nature of discursive encounter(s)	Organised by VEJA to publicly defend last remaining inhabitants of Steel Valley against pressure from Mittal to move out	VEJA and therefore Steel Valley become part of an international network observing and critiquing Mittal plants	A series of meetings between ArcelorMittal and VEJA
Discursive resources	Solidarity between VEJA members and these residents, and access to the media	Local knowledge of pollution, familiarity with global Environmental Justice movement	Boomerang effect through Mittal national office, local knowledge of pollution and workers' issues
Arena and its rules	Public opinion - an event that is interesting for media, because of prominence, conflict etc.	Global solidarity. New platforms for challenging Mittal are made available, e.g. international shareholders' meeting who may not be aware of Mittal's local tactics	Meeting between Mittal management and NGOs under the eye of head office and shareholders
Strategy and tactics	An organised event that attracts media attention - uses public opinion as a defence against Mittal tactics on the ground	Local knowledge of pollution and Mittal behaviour is shared with other local knowledge holders globally. This multiplies discursive resources through sharing and solidarity	Mittal tries to understand local challenge, and possibly fold these into its social responsibility investment. VEJA tries to press certain demands, including access to Master Plan
Existence of pollution	Pollution is assumed because of continuity in media coverage	Comparing evidence and patterns of pollution in Vanderbijlpark with those at other Mittal steel factories internationally allows a stronger picture to emerge	No change in strategy of denial. Mittal suggest that it "has moved on from the Master Plan", so that plan is no longer relevant, but still secret

Consequences of pollution	Raises questions about the after-effects of pollution and Mittal's strategy of and behaviour in enclosing resources	Comparing Mittal's treatment of local communities, governments and challengers internationally allow a better understanding of Mittal tactics	Consequences of pollution not recognised, but possibly to deal with some consequences via "corporate social investment"
Material power	Solidarity enables VEJA to organise event with few material resources	A network with international reach via South African Environmental Justice movement and internationally via Friends of the Earth, e.g. able to publish international case studies of Mittal's treatment of fenceline communities	VEJA has forced Mittal to talk to it and accede to some of its demands
Comments	Using the media – public opinion - as a defence against Mittal's tactics on the ground	Globalisation from below, making local knowledge global, extending solidarity and making it more powerful	Success of earlier interventions creates new terrain between Mittal and community - where discursive power is important (knowledge, manoeuvring)
Date	2007	2008	2008
Where discussed	Chapter 9	Chapter 9	Chapter 9

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